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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1889.

~~No. 983.~~ 89

THE NEW AMERICAN FILE COMPANY, APPELLANT,

vs.

THE NICHOLSON FILE COMPANY.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF RHODE ISLAND.

FILED AUGUST 29, 1887.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1889.

No. 383.

THE NEW AMERICAN FILE COMPANY, APPELLANT,

vs.

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INDEX.

	Original	Print.
Bill of complaint	1	1
Exhibit A—Letters patent No. 29236, granted Etienne Bernot July 24, 1860	8	5
B—Assignment of Etienne Bernot to George S. Norris, October 8, 1860	20	12
C—Assignment of Etienne Bernot to George S. Norris, August 9, 1862	22	13
D—Certificate of extension, July 23, 1874	24	15
E—Release from Bernot's heirs to Charles A. Nichols, November 12, 1874	25	15
F—Assignment of Charles A. Nichols to the New American File Company, December 1, 1876	28	17
Demurrer to bill	29	18
Opinion of Judge Lowell on demurrer	31	19
Order overruling demurrer	34	22
Answer	35	22
Replication	47	30
Evidence for complainant	48	31
Testimony of Edward E. Quimby	48	31
Exhibits put in evidence	64	41
Exhibit G—Letters of administration on estate of Etienne Bernot issued to Charles A. Nichols	66	42

JUDD & DETWEILER, PRINTERS, WASHINGTON, MARCH 20, 1890.

	Original.	Print.
Evidence for defendant	68	42
Testimony of Henry B. Renwick	68	43
John Hough	92	57
Alpheus B. Southwick	94	59
Robert W. Hamilton	100	62
William D. Sloan	103	64
James Fessenden	105	65
Thompson W. Decker	110	68
William T. Nicholson	114	70
Evidence for complainant	129	81
Testimony of Edward E. Quimby (recalled)	129	81
Robert Bell	139	86
James H. Hervey	143	89
Thomas Sully	145	90
Daniel C. Gorman	149	93
Owen F. Gorman	151	94
Evidence for defendant in rebuttal	153	95
Testimony of Henry B. Renwick	153	95
Exhibit John Crum Patent—Letters patent No 8199, granted John Crum July 1, 1851	156	96
Exhibit Miller and Decker Patent—Letters patent No. 23645, granted Charles Miller and Thompson W. Decker April 12, 1859	170	102
Exhibit Milton D. Whipple Patent—Letters patent No. 22842, granted Milton D. Whipple February 1, 1859	181	105
Exhibit Ross English Patent—English letters patent No. 545, granted Robert Craib Ross March 4, 1853	195	111
Exhibit Miller 1856 Patent—Letters patent No. 16064, granted Charles Miller November 11, 1856	205	116
Exhibit Whipple File Patent—Letters patent No. 28947, granted Milton D. Whipple June 26, 1860	211	118
Exhibit Miller and Decker File Wrapper—File wrapper and contents in the matter of letters patent No. 23645, granted Miller and Decker April 12, 1859	214	119
Stipulation as to Defendant's Exhibit "New York Directory"	237	126
Final decree	239	127
Opinion of Judge Colt	240	127
Bond on appeal	243	129
Clerk's certificate	245	130

1 Circuit Court of the United States, District of Rhode Island.

THE NEW AMERICAN FILE COMPANY
vs.
THE NICHOLSON FILE COMPANY.
} In Equity. No. 1007.

Bill of Complaint. Filed May 7th, 1879.

To the honorable the justices of the circuit court of the United States for the district of Rhode Island:

The New American File Company, a corporation created by act of the General Assembly of the State of Rhode Island, and doing business at Pawtucket, in said State, brings this its bill of complaint against the Nicholson File Company, a corporation created by act of the General Assembly of the State of Rhode Island, and doing business at Providence, in said State.

And thereupon your orator complains and says that before the thirty-first day of August, 1854, Etienne Bernot, of Paris, France, was the original and first inventor of a new and useful machine for cutting files, fully described in letters patent hereinafter mentioned, and which had not been known or used before his said invention and which had not been at the time of his application for a
2 patent, as hereinafter mentioned, in public use or on sale with his consent or allowance for more than two years prior to the said application.

And your orator further shows unto your honors that on the said thirty-first day of August, 1854, said Bernot obtained letters patent of the Government of France for said invention; and on the twenty-seventh day of March, 1855, said Bernot likewise obtained letters patent of the United Kingdom of Great Britain and Ireland, dated Oct. 16, 1854, for said invention, and that subsequently thereto, to wit, on the third day of July, 1860, the said Etienne Bernot made application according to law for letters patent of the United States to be granted to him for said machine for cutting files; upon which application, due proceedings being had in all respects, said letters patent were granted and issued to him on the twenty-fourth day of July, 1860, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents and numbered 26236, whereby there was secured to said Etienne Bernot, his heirs, administrators, or assigns, for the term of fourteen years from the said twenty-fourth day of July, 1860, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said machine, a description whereof is given in the words of the said Bernot in the schedule annexed to said patent and forming a part thereof, as by said patent numbered 29236, a copy whereof is hereto annexed, marked Exhibit A, and which your orator prays may be made a part hereof, will fully appear.

And your orator further represents that said Etienne Bernot assigned said letters patent numbered 29236 for the remainder of the

term therein specified to George Somerville Norris, a citizen of Baltimore, in the State of Maryland, by deed of assignment delivered the eighth day of October, 1860, and recorded at the Patent Office January 2, 1862, Liber K^6, page 160, of Transfers of Patents, and by
3 a supplemental deed of assignment delivered the ninth day of August, 1862, and recorded at the Patent Office April 2, 1863, Liber R^6, page 400, of Transfers of Patents, as by copies of said assignments, hereto annexed and marked Exhibits B and C, respectively, and made a part hereof, will fully appear.

And your orator further shows unto your honors that subsequent to the issuing of said patent numbered 29236 and subsequent to the said assignment to said Norris of October 8th, 1860, to wit, on the sixteenth day of July, 1862, said patent and said last-mentioned assignment were confirmed by a private act of Congress of the United States approved that day in the words and figures following, to wit:

"Thirty-seventh Congress, sess. II.

"Chap. CXCII.—An act to confirm and establish a patent heretofore granted to Etienne Bernot, dated July twenty-four, eighteen hundred and sixty, and to secure to George Somerville Norris, the assignee of said patent, the benefit of the full term for which said patent was granted.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the patent granted to Etienne Bernot on the twenty-fourth day of July, in the year eighteen hundred and sixty, for 'an improved machine for cutting files,' and which patent, on the face thereof, was granted for the term of fourteen years from the date of said patent, shall be, and the same is hereby, made a valid grant for the full term of fourteen years from the date of said patent, notwithstanding the fact that a patent had been previously granted in France for the same invention, and notwithstanding that said patent when issued ought to have been granted only for the term of fourteen years, to be computed from the date of the said patent previously issued in France.

4 "Sec. 2. And be it further enacted, That the title of George Somerville Norris, as assignee of said patent under the assignment made to him by said Etienne Bernot, dated October eight, eighteen hundred and sixty, and recorded in the Patent Office, shall be good and valid to vest in said assignee, his executors, administrators, and assigns, the executive right, under the said patent, for the full period of the term of fourteen years from the date of said patent, in like manner and to the same extent as if the said patent, when originally issued, had been validly granted for fourteen years from the date thereof.

"Approved July 16, 1862."

That thereafter, to wit, on the twenty-fifth day of September, 1873, said Etienne Bernot died, and thereupon, on the twelfth day

of May, 1874, letters of administration of his estate were duly taken out according to law, in the State of Rhode Island, by Charles A. Nichols, a citizen of Providence, in said State.

That afterwards and before the twenty-third day of July, 1874, the said Charles A. Nichols, then being a citizen of the United States, as such administrator and in behalf of the heirs-at-law of the said Etienne Bernot, did present his petition to the Commissioner of Patents for an extension of said letters patent, and, the said Charles A. Nichols having fully and in all respects complied with all the requirements of the law in that behalf, such action was thereupon had that the said Commissioner of Patents, by virtue of the power vested in him by the act of Congress approved the eighth day of July, 1870, entitled "An act to revise, consolidate, and amend the statutes relating to patents and copyrights," did renew and extend the said patent for the term of seven years from and after the expiration of the first term, viz., from the twenty-fourth day of July, 1874; by reason of which the benefit of said invention for such extended term accrued to the said Charles A. Nichols as such administrator, and the patent has now the same effect in law as though the same had been originally granted for the term of twenty-one years, as by the said Commissioner's certificate of extension, a copy of which is hereto annexed, marked Exhibit D, and made a part hereof, will fully appear.

That afterwards Flore Louise Vanier, Etienne Marie Bernot, Charles Eugene Bernot, and Louis Georges Duzochel, the heirs-at-law of said Etienne Bernot, assigned all their right, title, and interest to and in said extended patent numbered 29236 to said Charles A. Nichols by deed of assignment delivered the twelfth day of November, 1874, and recorded in the Patent Office February 11th, 1878, Liber J^{22}, page 364, of Transfers of Patents. A copy of said assignment is hereto annexed and made part hereof, marked Exhibit E.

That said Charles A. Nichols assigned said extended patent numbered 29236 to your orator by deed of assignment delivered December 1st, 1876, and recorded in the Patent Office February 11th, 1878, Liber J^{22}, page 362, of Transfers of Patents, as will fully appear from a copy of said assignment, which is hereto annexed and made part hereof, marked Exhibit F.

And your orator further shows unto your honors that the exclusive right and liberty under said patent has been and still is of great value and profit to your orator; yet the defendant, well knowing the premises, but contriving to injure your orator and to deprive it of the benefit and advantage which might and otherwise would accrue to it from said invention, without the consent of your orator and in infringement of the said patent, has made, sold, and used and still does make, sell, and use large numbers of machines substantially the same as that described in said letters patent, the exclusive right to make, use, and sell which is vested in your orator by said extended letters patent and the assignments above referred to; but how many of said patented machines have been made, sold, and used by the defendant your orator, for want of a discovery

thereof, does not know and cannot set forth; and your orator
6 prays that the defendant may be made to set forth the same in answer.

And your orator has requested said defendant to acknowledge *his* rights in the premises and to desist and refrain from making, using, and selling said patented machines and to account with and pay to your orator what is justly due to your orator by reason of said infringement.

But now so it is, may it please your honors, that said defendant wholly refuses so to do, contrary to equity and good conscience and to the manifest wrong of your orator in the premises.

To the end, therefore, that the said defendant may, if it can, show cause why your orator should not have the relief herein prayed and may, under the oath of its proper officer and according to its best and utmost knowledge, remembrance, information, or belief, full, true, direct, and perfect answer make to all and singular the premises, and especially may answer, discover, and set forth whether during any and what period of time and whether at said Providence or elsewhere it has made, used, and sold said machines, and how many of them it has made, used, sold, or introduced since the date of said assignment to your orator;

And that the defendant may be decreed to account for and to pay over to your orator all gains and profits resulting from said infringements, and may be restrained by an injunction to be issued out of this honorable court from making, using, or selling the improved machine for cutting files described in said letters patent or any machine substantially the same as that so described, and for such other and further relief in the premises as the nature of the case may require and to your honors shall seem meet—

May it please your honors to grant unto your orator not only a writ of injunction conformable to the prayer of this bill, but also a writ of subpœna, directed to the said Nicholson File Company, commanding it, at a certain time and under a certain penalty, therein to be limited, personally to be and appear before your honors and this honorable court, then and there to answer
7 unto this bill of complaint and to do and receive what to your honors shall seem meet in the premises.

NEW AMERICAN FILE CO.,
STEPHEN A. JENKS, *Treasurer.*

W. W. & S. T. DOUGLAS,
Complainant's Solicitors.
CHAUNCEY SMITH, *Of Counsel.*

DISTRICT OF RHODE ISLAND, *sc:*

In Providence, in said district, on this first day of May, A. D. 1879, personally came Stephen A. Jenks, treasurer of the complainant corporation, and made oath that the facts therein stated as of the knowledge of said complainant corporation are true, and those

facts which are therein stated on information and belief he verily believes to be true.

Before me— WM. W. DOUGLAS,
U. S. Commissioner for said District of Rhode Island.

8 EXHIBIT A.

No. 29236.

THE UNITED STATES OF AMERICA.

To all to whom these letters patent shall come:

Whereas Etienne Bernot, of Paris, France, has alleged that he has invented a new and useful improved machine for cutting files, which he states has not been known or used before his application; has made oath that he is a citizen of the Empire of France; that he does verily believe that he is the original and first inventor or discoverer of the said machine, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of three hundred dollars and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said machine, and praying that a patent may be granted for that purpose:

These are, therefore, to grant according to law to the said Etienne Bernot, his heirs, administrators, or assigns, for the term of fourteen years from the twenty-fourth day of July, one thousand eight hundred and sixty, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said machine, a description whereof is given in the words of the said Etienne Bernot in the schedule hereunto annexed and is made a part of these presents.

In testimony whereof I have caused these letters to be made patent and the seal of the Patent Office has been hereunto
9 affixed. Given under my hand, at the city of Washington, this twenty-fourth day of July, in the year of our Lord one thousand eight hundred and sixty, and of the Independence of the United States of America the eighty-fifth.

[SEAL.] JACOB THOMPSON,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.
PHILIP F. THOMAS,
Commissioner of Patents.

Ex'd: C. E. U.

The Schedule Referred to in These Letters Patent and Making Part of the Same.

To all to whom these presents shall come:

Now know ye that I, Etienne Bernot, do hereby declare the nature of the said invention and in what manner the same is to be performed

to be particularly described and ascertained in and by the following statement thereof, reference being had to the drawings hereunto annexed and to the figures and letters marked thereon—that is to say, my invention consists in new mechanical arrangements for the construction of a machine for cutting files.

Description of the drawings.

Here follow diagrams marked pp. 9*a*, 9*b*, & 9*c*.

Drawing I represents a front elevation of the machine (figure 1); drawing I also represents a side elevation of the machine and a section through A B and E F, figure 1, for showing more clearly the interior of the machine (figure 2); drawing II, plan of the whole machine (figure 1). Figure 2, drawing II, represents a vertical section through the line X X of the drawing II (figure 1). Figure 3, drawing II, is a section through P O, figure 2, drawing II, and through R S, drawing II (figure 1). Figure 4 represents a front view of the buffer, and in the manner in which the half-circular file is fixed. Figures V and 6 also represent the manner of fixing the three-sided and rat-tail files.

A B C D, cast-iron, frame, upon which the various parts of the machine are set up. E F, lower part of the frame, serving as foundation to the machine; this part is hollow internally, and by its arrangement allows the connecting rod V^1, shown by dotted lines, to work vertically, as represented in drawing I, but chiefly in figure 2, drawing II, which, being a vertical section, shows the working and the manner in which motion is communicated more clearly. G, stone pedestal, by which the whole of the machine is supported. The bolts *a a* are seated into the pedestal and run through the iron foundation E F and plate O, uniting them together, so as to form but one piece. H, cast-iron pulley (the diameter of which may vary), serving to put in motion the whole of the machine. L^1 M N, horizontal shaft, set in motion by pulley H and mounted on a barrel, L, turning round in a socket, L^1, forming part of the shaft L^1 M N, and cogging by means of the lever J in J^1, thus setting the shaft in motion as hereinbefore described. I, fly-wheel, fixed upon the barrel of the pulley and serving to regulate the rotative motion of the shaft L^1 M N. K K, plummer blocks forming part of the frame, and in which the horizontal shaft L^1 M N works. O^1, cam, mounted upon and fixed to the centre O^2 of the horizontal shaft by a conical shoulder running through it and a screw which fastens them together, as shown in figure 2, drawing II. This cam, being fixed to the horizontal shaft, encounters during the revolution of the latter the ram beam P Q, which slides between two grooves V, cut in the upright of the frame, and gives to it an ascending movement. R, ring enclosing eccentric R^1. During the movement of the horizontal shaft the ring R, fixed to the rod S, gives to the latter a to-and fro movement, as shown in drawing 1 (figure 2) and drawing II (figure 1). T, balance lever, jointed at the point U V and pivoting by means of the axis X. This connecting rod has towards its centre a groove which allows it to ascend

or descend according to the catch Y. The catch Y, at each to-and-fro movement, causes the rachet wheel Z to turn by pushing it before it. The stroke of the catch Y is always calculated so as to cause the rachet wheel Z to advance one cog at each movement.

A^1, counter-catch for preventing the ratchet wheel Z making a retrograde movement. It is movable on the point B^1, and can by means of the grooved piece B^1 C^1, which receives it, advance or recede with it, according to the required inclination. This inclination is always regulated by that of the cog of the ratchet wheel, which varies in size according to the degree of fineness to be obtained. In order to prevent the rising of the catches two springs bear constantly on the points Y of one and on A^1 of the other.

D^1, small horizontal shaft set in motion by the ratchet wheel Z. At the extremity of this shaft is a pinion E^1, upon which the cog wheel F^1 works. This wheel is set upon a horizontal shaft, G^1, to the middle of which is fixed a pressure eccentric, H^1. The spokes which serve to form the circumference have been calculated so as to press continually in its rotation in a proportionate manner upon a spring, I^1. It only travels over three-fourths of the circumference, and, as this movement has been determined by the length of the file, it therefore follows that each time one of the surfaces of the file has been cut the wheel F^1 returns and imparts to it its motion by means of the two hand levers J^2, which form part of the said wheel F^1. The handles also serve as a mark for replacing the eccentric at its starting at each new cutting. I^1, main tempered steel spring, fixed by a counter-plate and two screws to the centre of a movable shaft K^1.

Another small spring, L^2, also fixed to the shaft K^1, rests upon a stop, M^1, and serves to prevent the main spring I^1 from taking a vertical direction, which, owing to the mobility of the shaft K^1, to which it is fixed, would otherwise take place. During the action of the machine the eccentric H^1 is constantly in contact with the main spring I^1. It will be readily understood, bearing in mind the ascending movement which the cam imparts to the beam P Q, that the beam encounters the main spring each time, and consequently the elastic force of the latter varies according to its contact with the eccentric. The beam P Q is provided at its lowest end with a graver or chisel, N, which is firmly fixed by a counter-plate, which, with two bolts running through it, prevents the chisel N acting on the beam itself.

12

The carriage of the graver should always be perpendicular to the axis of the beam P Q, and consequently have its edge parallel to the surface of the file to be cut. When once this object is obtained the file, notwithstanding the irregularities of thickness in all its transverse section, will always present a line of contact parallel to the cutting edge of the graver. It will be seen by the preceding that as the elastic force of the main spring I^1 upon the beam varies in proportion as the eccentric performs its movements this beam descends with more or less force, and consequently by means of the graver at its end cuts the lines upon the file always of an equal depth. The mechanism working the eccentric is ar-

ranged that it should exert the strongest pressure upon the middle of the file, where the surface to be cut is the largest, and that the pressure should gradually diminish in advancing towards the extremities, and thus produce the cutting of a uniform depth. The movement of the eccentric is regulated by means of the supports A^5 B^5, upon which it rests. These supports slide in grooves C^5, and are fixed by a semi-circular piece D^5. The mechanism for setting the file in motion is as follows: O^3, shoulder, forming part of the horizontal shaft M N. In the middle of this shoulder a handle, P^1, slides, which is fixed by means of a screw bolt when its range is determined. Q^1, main connecting rod, provided with a pulley, R^3, at its upper part and jointed at its lower part in S^1. This
13 connecting rod, set in motion by the handle P^1, which works with the horizontal shaft M N, gives to the rod T^1 a to-and-fro vertical movement. At the lower part of the rod T^1 is a small pulley, U^1, jointed to its extremities, and which sets in motion a connecting rod, V^1, suspended at its other extremity to a pulley, X, similar in construction to the pulley U^1, but which remains fixed while it pivots on the point V^1, bolted to the framing of the machine. At the middle of the balance lever V^1 rests a vertical rod, Z^1 A^2, jointed at Z^3, and which also receives a to-and-fro vertical movement from the rod T^1 by means of the balance lever V^1. This rod Z^1 A^2 slides frictionwise in a barrel provided with a shoulder at its lower part and tapped at its upper part to receive a round, nutted screw which presses it firmly between the plate hereinbefore described, and set on the framing of the machine and the buffer-carrier B^3.

At the upper part of the rod z^1 A^2 is another balance lever C^2, jointed to the left extremity at D^2, as shown in drawing I, provided with a pulley, also jointed at its lower part at B^2 and pivoting upon an ear fixed to the buffer-carrier B^3. The right-hand side of this balance lever communicates to the connecting rod G^2, with which it is jointed, an ascending and descending movement which it has received from the rod Z^1 A^2. The connecting rod G^2 can work in any direction, being provided at each of its extremities a^3 with universal joints. The arched arm J^3, which is fixed to the upper part of the connecting rod G^2, receives from the latter a to-and-fro movement, which it communicates to the connecting rod L^3, which, like the arm J^3, forms part of the shaft K^2 (as seen in drawing I, figure 2), working in two plummer blocks M^2 N^2. The connecting rod L^3, being attached to the small pulley M^3 by the rod N^3, jointed to both at the points O^2 and P^2, gives to the pulley M^3 a to-and-fro motion, and causes the ratchet wheel R^3 to advance one cog each time by the pressure of the catch S^2, which pushes it successively before it. To prevent the pulley M^3 moving too
14 freely, it is attached to a support, T^2, at the lower part of which is a ring cut in two and reunited by two claws and two screws. This ring rotates freely upon the shaft U^2, which receives a circular movement from the ratchet wheel R^3, forming part of it by the pressure of a nut with cap, V^3, against one of the shoulders of the shaft U^2.

A counter-catch, Y^2, serves to prevent the ratchet wheel from making a retrograde movement. This counter-catch can be lengthened or shortened at will by means of the piece z^2, which slides in a screw bolt into an iron plate, b^3, serving as support to the plummer blocks N^2 and M^2. When the length of the catch is determined it is merely necessary to bear strongly upon the head of the bolt to keep at the same length the catch V^2. Its length and inclination are always dependent on the fineness of the cogs of the ratchet wheel upon which it is to act. It will be seen from what has herein been described that the ratchet wheel R^3 gives a circular movement to the shaft U^2. This shaft, which works in two plummer blocks B^4 B^4, is provided at its other extremity with an endless screw, C^3, which in turning advances or recedes, according to the impulse given to it by a rack, D^3, with which it cogs. The rack D^3, as represented in drawing I (figure 2) and figure 2, drawing II, travels the whole of the length when gliding through a semi-hollow cylinder, E^3 F^3, provided at its lower extremity with a groove, G^3, serving as guide to this rack. Towards the extremities of this rack are two stops H^3 H^3, serving to direct the upper part or buffer I^3 that rests upon it.

This buffer I^3 is of the form of a demi-cylindrical prism, and has towards its extremities two grooves made in it which slide freely in a transverse direction to the demi-prism while held by the stops H^3 H^3. The demi-prism, as shown in figure 3, drawing II, moves in a transverse direction to E^3 F^3, with which it moves with a gentle friction. It can therefore move freely round E^3 F^3, and at the upper surface change its position from a horizontal to an inclined position either to the right or left. At the upper part of I^3 a groove is formed through the whole of its length, and at the bottom of this groove an iron plate, *m*, is let in, the upper surface of which represents exactly the shape of the file which is to be submitted to the action of the machine. Between the file and plate *m*, as well as upon the lateral side of the file, zinc bands are placed, in order that the stroke of the beam P Q should not impair the cut lines already produced. Figure 3, drawing II, shows the manner in which the file is fixed upon the buffer. In this figure the grooves made in the buffer are shown in section, and receive, as shown in plan, figure 1, drawing II, two wedges, a^5 b^5, of which the left one is fixed and the right one movable. This last forms part of a screw with the prolonged threads. This screw is supported by a piece of iron fixed to I^3 by means of rivets. If, therefore, this screw is set in motion by means of its handle *n*, it causes to advance or recede the movable wedge to which it is jointed, and which then tightens or slackens the file against which it is applied. The buffer I^3 works longitudinally by means of an endless screw cogging with the rack D^3, upon which it rests. It will be readily understood on referring to figure 2, drawing II, that the motion can also be produced in a transverse direction by means of grooves made towards the extremities of the buffer and sliding freely in the stops H^3 H^3 of the rack D^3. The buffer I^3 has on each side of its lateral faces semicircular pieces a^2 a^2 (shown in black dotted lines), forming

an axis and pivoting in circular grooves hollowed out in the interior of the uprights of the support B^3, by which the circular, alternate, and vertical movement is given to the buffer-carrier, and afterwards to the buffer itself. This movement is combined so as to pass from a horizontal to an oblique direction, and from an angle which can reach 60°, and allows of regulating at will the inclination of the cuttings of the file. When the requisite cutting tool is regulated, the whole mechanism is stopped, to prevent any movement from top to bottom, by means of an iron rod, T, moving at its lower part *e* round a bolt screwed into one of the uprights of
16 the support. At the upper part of this rod is a groove, in which slides a bolt, *f*, screwed into the buffer-carrier. The lateral faces of the said rod are divided into 60 parts, so as to correspond to the 60° of the angle that the buffer may have to describe. The bolt *f* then performs the function of slider with the iron rod T, which by means of the divisions marked thereon becomes a scale of vertical inclinations. If, therefore, the nuts of the two bolts are strongly pressed the buffer will be prevented from moving in a vertical direction. It will be seen by the foregoing description that the file, the buffer, its carrier, and the support B^3 form but one body, which moves in a horizontal plane and allows the file to present itself to the graver from right to left for the first cut and from left to right for the second. The support is provided at its lower part with a disk, B^3, in which the uprights *g g*, already described, are enclosed and retained by bolts. A fusee, *h*, passes through the centre of this disk and acts as a pressure bolt to the plate O, through which it also passes. This fusee *h* is held by a head, *i*, at its lower part and at its upper part by a round nut, *j*, pierced with six vertical holes to receive the key for holding it firm. These several movements are shown in red in figure 1, drawing II. At the centre of the disk B^3 at K, is a mark which also serves to regulate the cross angular cuttings. This mark, shown by the vertical line *k l*, corresponds to a semi-circle divided on each side into 60 degrees, beginning at the point K. It will be understood that *o*, beginning at K, the reading of the degrees is either from left to right or *vice versa*. *p* is a plate having at its centre *q* a groove, shown in black dotted lines. This plate is fixed to the main frame by means of two screw bolts. Behind this plate *p* is a disk, which has at its centre *r* an axis of the same diameter as the above-mentioned groove. This groove is made so as to allow the axis of the counter-plate to slide from right to left on it, and to describe in its motion an arc of a circle, of which the point S is the centre, and which pivots on the point S of the plate, to which it is held by a nut, *t*. This movement
17 serves only to regulate the disk, which is fixed to the plate by means of a nut, *t*. This disk is shown in figure 1, drawing I, in black dotted lines, and in figure 2 by the letter p^1. U, dovetailed guide, sliding freely in the disk p^1, its movement takes place from top to bottom and from right to left—that is to say, similarly to the disk with which it slides. At the upper part of this guide U, at the point V, a rod is riveted which acts as an axis and serves to receive the main lever. *x*, arm of the lever jointed at *y*, *z*,

and u. The small arm $y\ z$ is held at the point z to the plate p when the apparatus is not in motion. At the extremity of the main arm x is fixed a cast-iron ball which exerts a constant pressure upon the guide U, with which it communicates by means of the rod V, which acts at the same time as a pivot and axis of the main arm x. A^1, small crutch moving at B^1, serving to receive the arm of the lever x, which rests upon it at C^1, when the latter ceases to bear upon the guide U. This movement takes place every time a new line is cut, and is represented colored red in figure 1, drawing I. Owing to the peculiar arrangement of this part of the machine, when the guide U is once regulated by the counter-plate or disk in which it slides it acts as a press and guide at the same time—that is to say, it always forces the file upon which it rests during the cutting operation to keep parallel to the graver N^1, by which the cutting is performed. The flat files are maintained upon the buffer I^3 by means of pressure and zinc wedges which embrace three faces of the file submitted to the cutting. I will now proceed to describe the manner in which the half-round and rat-tail files are fixed upon the buffer I^3. For the half round see figure 4, drawing II. A zinc plate, d^1, is cast, upon which the plane surface of the file (previously cut by the same process as the flat file) rests. The concave part e^1, which retains one of the convex sides of the file, is moulded upon this file. This plate is held on the buffer by two grooves $j^1\ j^1$, and is subjected to all the transverse movements given to the buffer. It will be
18 readily understood that if a plummer block, $g^1\ g,^1$ slides in the buffer- carrier $E^3\ F^3$, and is held to the buffer by means of a groove made in the semi-disk h^1, fixed to the vertical face of the buffer by two screws, that the buffer can move transversely and take with it the plummer block $g^1\ g^1$, which is kept with gentle friction by the circular cheek $i^1\ i^1$ of the semi-disk h^1. Upon the plummer block $g^1\ g^1$ is a movable cath, j, held by a spring, k. This catch forces itself into the openings $l^1\ l^1\ l^1$ made in the cheek of the semi-disk h^1, and serves to hold the file steady during the cutting and action. It will be seen in figure 4, drawing II, that an opening corresponds with the surface of the file to be cut. According to the arrangement shown in that figure, only one-half of the file can be cut at a time. For cutting the other half it suffices to mould another zinc plate in a contrary direction and to operate in the same manner. For cutting the three-faced files and rat-tail form the arrangement of plummer blocks is the same as for the half-round file—that is to say, the bearing $g^1\ g^1$ moves with the buffer only. It is fixed to it by means of two screws $z^3\ z^3$. Between the internal face and the face of the buffer is a circular gorge in which a washer, a^3, about one-third of an inch in thickness freely moves, and is provided with three equidistant holes for cutting the three-faced files, and for the rat-tail form there are ten holes. A screw, V^2, running through the plummer block $g^1\ g^1$ is inserted into the buffer and forms a projection in the bottom of the gorge. This screw acts as a support and stop to the washers which successively present their openings to this screw according as a longitudinal cut is finished. The zinc plates which receive each of the files

are previously moulded upon them (as for the half-round files) and sink into the buffer by means of grooves made in each side. To prevent the file from moving during the cutting operation, its end is inserted in openings made in the washers. These openings are of the same form as the ends they are to receive.

And having now described the nature of my said invention and the manner of putting the same into execution, I wish
19 it to be understood that I do not confine myself to the precise details of construction herein laid down, as the same may be varied; but what I claim is—

First. The particular arrangement of buffer-carrier for the manufacture of files, as hereinbefore described and referred to in figures 1 and 2, drawing I, and figures 4, 5, and 6, drawing II.

Secondly. The combination of a chain composed of levers and connecting rods, with ordinary or universal joints capable of working in all directions, as hereinbefore described and referred to in figures 1 and 2, drawing I.

Thirdly. In the arrangement of a guide set parallel to the graver, as hereinbefore described and referred to in figures 1 and 2, drawing I, and figure 2, drawing II.

Fourthly. In the arrangement of an eccentric the pressure of which is proportionally exerted upon a spring, as hereinbefore described and referred to in the figures 1 and 2, drawing I, and figures 1 and 2, drawing II.

ETIENNE BERNOT.

Witness:
GEO. HULTON.
HENRY W. SPENCER.

Ex'd: Moss.

20 EXHIBIT B.

Whereas I, Etienne Bernot, of the city of Paris, in the Empire of France, have invented an improved machine for cutting files, for which letters patent under the great seal of the United States of America, bearing date on the twenty-fourth day of July, eighteen hundred and sixty, have been granted to me at the city of Washington, the said letters patent being numbered (29236) twenty-nine thousand two hundred and thirty-six; and whereas George Somerville Norris, of the city of Baltimore, in the State of Maryland, one of the United States of America aforesaid, has purchased from me all the right, title, and interest which I have in the said invention, and has paid to me the sum of thirty thousand francs as the consideration of said purchase: Now, it is hereby witnessed that in consideration of the said sum of thirty thousand francs to me paid I do hereby assign and transfer unto the said George Somerville Norris, his executors, administrators, and assigns, all my right, title, interest, and claim in and to the said invention for the United States of America and to the aforesaid letters patent, and all the license, powers, rights, and privileges secured to me thereby; to have and to hold, receive, take,

and exercise the said especial license, sole privilege and authority, invention, letters patent, and all and singular the premises hereby assigned or intended to be unto and by the said George Somerville Norris, his executors, administrators, and assigns, for and during the residue of the term of years granted and created by the aforesaid letters patent to his and their sole use, benefit, and advantage; and I, the said Etienne Bernot, for myself, my heirs, executors, and administrators, do hereby covenant with the said George Somerville Norris, his executors, administrators, and assigns, at his or their
21 request and expense, to execute and deliver to him or them or to such of them as may be entitled thereto all such further and other deeds and assurances as may be deemed requisite for the more perfect assuring and confirming to him and them the privileges, rights, and powers hereby assigned or intended to be.

Witness my hand and seal this eighth day of October, eighteen hundred and sixty.

ETIENNE BERNOT. [SEAL.]

Test:
HENRY W. SPENCER.
GEO. HULTON.

Consulate of the United States of America, Paris, France.

On this eighth day of October, eighteen hundred and sixty, before me, Henry W. Spencer, United States consul for the city of Paris, personally appeared Etienne Bernot, known to me to be the person described in and who executed the foregoing writing or instrument, and he acknowledged the same to be his free act and deed.

[SEAL.] In testimony whereof I have hereunto set my hand and official seal on the day and year aforesaid.

HENRY W. SPENCER,
United States Consul.

No. 1095.

U. S. PATENT OFFICE.

Received December 27, 1861, and recorded January 2, 1862, in Liber K^6, page 160, of Transfers of Patents.

[SEAL.] In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

D. P. HOLLOWAY,
Commissioner of Patents.

G. N. C.

22 EXHIBIT C.

Whereas I, Etienne Bernot, of the city of Paris, in the Empire of France, did heretofore, to wit, on the twenty-fourth day of July, A. D. eighteen hundred and sixty, obtain letters patent under the great seal of the United States of America for an improved machine for cutting files; and whereas doubts have arisen as to how many years the said patent is to endure by reason of my (said Bernot) having previously obtained a patent for the said invention or

machine in the Empire of France, and the fact of such granting and the date thereof, and the said patent, with the specifications attached, or a sworn copy not having been filed in the Patent Office of the United States, as required by section 60 of the rules and directions for proceedings in the Patent Office, published by the Commissioner under date of 1st of May, A. D. 1861; and whereas I have heretofore sold and assigned to George Somerville Norris, of the city of Baltimore and State of Maryland, all my right, title, claim, and interest in and to the said invention and patent in and for the said United States of America, and such sale having been made under the assumption by both parties that the said patent so granted by the said United States would endure for the space of fourteen years, and the said mistake or failure on my part as to compliance with said rules and directions having been without any fraudulent intent, but from inadvertence and ignorance, and having covenanted in said assignment for other and further deeds of assurance for the confirmation and perfection of the title of said Norris in and to said patent: Now, in consideration thereof, I hereby authorize the said Norris, for me and in my name, either now or at the expiration of said patent, to apply for a renewal or extension thereof in his discretion, and so to act in my name that he and his assigns may obtain the exclusive use of said invention for the full number of years assumed to have been sold by me to said Norris in the assignment aforesaid; and I hereby covenant with said
23 Norris, his personal representatives and assigns, that any renewal or extension of said patent, no matter how or when acquired, shall enure to his or their use and benefit for the number of years so assumed to have been sold to him as aforesaid, and I also covenant with him and them to do any and all further acts of further assurance necessary to perfect the title of said Norris or his assigns in and to said patent to the extent of years as aforesaid.

Witness my hand and seal this ninth day of August, A. D. 1862, at Paris, in the Empire of France.

BERNOT. [SEAL.]

Sealed and delivered in the presence of—
GEO. HULTON.
DAVID FULLER.

Consulate of the United States of America, Paris, France.

Be it known that on the ninth day of August, one thousand eight hundred and sixty-two, before me, John Bigelow, consul of the United States of America, at Paris, in the Empire of France, personally appeared Etienne Bernot, known to me to be the person named in and who executed the within instrument, and acknowledged the execution thereof for the uses and purposes therein mentioned.

In testimony whereof I have hereunto set my hand and seal of office the day and year above written.

No. 1,100.
R. $2.

[SEAL.]

JOHN BIGELOW,
United States Consul.

U. S. PATENT OFFICE.

Received March 25th and recorded April 2d, 1863, in Liber R 6, page 400, of Transfers of Patents.

[SEAL.] In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

D. P. HOLLOWAY,
Commissioner of Patents.

J. D. P.

24 EXHIBIT D.

Certificate of Extension.

Whereas, upon the petition of Charles A. Nichols, of Providence, Rhode Island, administrator of the estate of Etienne Bernot, deceased, for the extension of the patent granted to said Etienne Bernot July 24, 1860, for an "improved machine for cutting files," the undersigned, in accordance with the act of Congress approved the 8th day of July, 1870, entitled "An act to revise, consolidate, and amend the statutes relating to patents and copyrights," did, on this twenty-third day of July, 1874, decide that said patent ought to be extended:

Now, therefore, I, Mortimer D. Leggett, Commissioner of Patents, by virtue of the power vested in me by said act of Congress, do renew and extend the said patent and certify that the same is hereby extended for the term of seven years from and after the expiration of the first term, viz., from the twenty-fourth day of July, 1874; which certificate being duly entered of record in the Patent Office; the said patent has now the same effect in law as though the same had been originally granted for the term of twenty-one years.

[SEAL.] In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed this twenty-third day of July, 1874, and of the Independence of the United States the ninety-ninth.

M. D. LEGGETT,
Commissioner.

25 EXHIBIT E.

Whereas, upon petition of Charles A. Nichols, of Providence, Rhode Island, administrator of the estate of Etienne Bernot, deceased, for the extension of the patent granted to said Etienne Bernot on the twenty-fourth day of July, eighteen hundred and sixty, for an improved machine for cutting files, said patent was extended for the term of seven years from the twenty-fourth day of July, eighteen hundred and seventy-four; and whereas we, the undersigned, Flore Louise Vanier, Etienne Marie Bernot, Charles Eugene Bernot, and Louis Georges Durochel, heirs-at-law of said Etienne Bernot and inheritors of his estate, real and personal, have received certain valuable considerations in full satisfaction of all our right, title, and interest in and to the said extension from the said Charles A. Nichols, the receipt of which is hereby acknowledged; and whereas the said Charles A. Nichols has become the administrator of the said Etienne

Bernot solely for the purpose of procuring said extension and in pursuance of and compliance with the law relating to the same; and whereas the said application for extension by said Charles A. Nichols, administrator, was made by our authority and in pursuance of a proposition for the purchase of said extension by the said Charles A. Nichols, which proposition has been heretofore accepted by us, and full payment for the same has been made to us as aforesaid; and whereas no other property or interest in property of said Etienne Bernot has come into the possession of said Charles A. Nichols, administrator, or is within the jurisdiction of the United States of America or of either of them: Now, in consideration of the premises and of one dollar to us in hand and to each of us in hand paid, the receipt of which we hereby severally acknowledge, we hereby release, discharge, and acquit the said Charles A. Nichols of and from any and all liability to account as administrator as aforesaid,
26 hereby intending to confirm to said Charles A. Nichols, his legal representatives and assigns, the full use and enjoyment of the property in said extended patent, and to confirm any and all conveyances of the said extension or extended patent which may have been or may be made by said Charles A. Nichols, administrator, free from all liability to account to us as aforesaid, as if the said extension had been granted to said Charles A. Nichols in his own right; and we do hereby severally covenant to and with said Charles A. Nichols that we will execute any further or other instrument that may be required to confirm the title of said Charles A. Nichols, his legal representatives or assigns, to said extension and to the full use and benefit of said invention for the said extended term whenever required so to do by said Charles A. Nichols, his legal representatives or assigns, without any further cost or expense to said Charles A. Nichols, his legal representatives or assigns, except such necessary expenses as may be incurred in execution of such other or further instrument.

In witness whereof we have hereunto severally set our hands and seals this twelfth day of November, one thousand eight hundred and seventy-four.

FLORE LOUISE VANIER, [SEAL.]
D. V. BERNOT,
CHARLES EUGENE BERNOT, [SEAL.]
L. G. DUROCHEL, [SEAL.]
ETIENNE MARIA BERNOT, [SEAL.]
By CHARLES EUGENE BERNOT,
By Power of Attorney.

In the presence of—
ROB'T M. HOOPER.
DAVID T. STRATTEN, *P.*

Jan. 12, r'd.
(Stamp:) Patent Office, U. S. A., Feb. 11, 1878.

27 U. S. CONSULATE GENERAL, PARIS, FRANCE.

Be it known that on the twelfth day of November, one thou-

sand eight hundred and seventy-four, before me, the undersigned, A. T. A. Torbert, consul general of the United States of America, personally appeared Flore Louis Vanier ne Bernot, Charles Eugene Bernot, L. G. Durochel, Etienne Marie Bernot, per power of attorney, by Charles Eugene Bernot, who are known to me to be the persons who executed the within instrument, and acknowledged that they executed the same freely and voluntarily for the uses and purposes herein mentioned.

[SEAL.] In witness whereof I have hereunto set my hand and official seal the day and year above written.

A. T. A. TORBERT,
U. S. Consul General, Paris.

Received for record February 11, 1878, and recorded in Liber J 22, page 364, of Transfers of Patents.

[SEAL.] In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

W. H. DOOLITTLE,
Acting Commissioner.

Ex'd: F. C. T.

28 EXHIBIT F.

Whereas letters patent bearing date the twenty-fourth day of July, eighteen hundred and sixty, were granted by the Government of the United States, under the seal thereof, unto Etienne Bernot, of France, for an improved machine for cutting files; and whereas, upon petition of Charles A. Nichols, of Providence, Rhode Island, administrator of the estate of said Etienne Bernot, deceased, the said patent and the exclusive right and liberty of making and using and vending to others to be used the invention particularly described and specified in the schedule annexed to said letters patent was extended for the term of seven years from the twenty-fourth day of July, eighteen hundred and seventy-four: Now, therefore—

Know all men by these presents that I, the said Charles A. Nichols, administrator of the estate of Etienne Bernot, in consideration of one dollar to me paid by the New American File Company, a corporation created by act of the General Assembly of the State of Rhode Island, the receipt of which is hereby acknowledged, have granted, assigned, and set over, and do by these presents grant, assign, and set over, unto the said New American File Company, its successors and assigns, the said extended letters patent and all my right, title, and interest in and to the said invention; to have and to hold the same to the said New American File Company, its successors and assigns, in as full and ample manner, to all intents and purposes, as I might have and hold the same for and during the rest and residue of said term of seven years.

In witness whereof I have hereunto set my hand and seal this first day of December, one thousand eight hundred and seventy-six.

CHARLES A. NICHOLS. [SEAL.]

In presence of—
STEPHEN A. JENKS.

Received for record Feb'y 11th, 1878, and recorded in Liber J 22, page 362, of Transfers of Patents.

[L. S.] In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

W. H. DOOLITTLE,
Acting Commissioner.

29 *Demurrer. Filed July 18th, 1879.*

Circuit Court of the United States, District of Rhode Island.

NEW AMERICAN FILE CO.
vs.
NICHOLSON FILE CO.

This defendant, by protestation, not confessing or acknowledging all or any of the matters and things in the said complainant's bill to be true in such manner and form as the same are therein set forth and alleged, doth demur thereto, and for cause of demurrer showeth that the said complainant hath not in and by its said bill made or stated such a case as doth or ought to entitle it to any such discovery or relief as is thereby sought and prayed for from or against this defendant. Wherefore this defendant demands the judgment of this honorable court whether he shall be compelled to make any further or other answer to the said bill, and prays to be hence dismissed with its reasonable costs in this behalf sustained.

NICHOLSON FILE CO.,
Per BENJ. F. THURSTON, *Sol'r.*

BENJ. F. THURSTON,
Of Counsel for Nicholson File Co.

I, Benjamin F. Thurston, of counsel for the defendant corporation, do certify that in my opinion the demurrer of the defendant is well founded in point of law.

BENJ. F. THURSTON.

30 William T. Nicholson deposes and say: I am president of the Nicholson File Co. The foregoing demurrer filed by the defendant corporation is believed by me to be well founded in law, and the same is not interposed for delay.

W. T. NICHOLSON, *President.*

DISTRICT OF RHODE ISLAND, STATE OF RHODE ISLAND, } *sc:*
Providence,

Subscribed and sworn to by the said William T. Nicholson before me, in the city of Providence, this 17th day of July, A. D. 1879.

GEORGE FULLER,
[SEAL.] *Notary Public.*

31 *Opinion on Demurrer Filed June 29th*, 1881.

United States Circuit Court, District of Rhode Island.

NEW AMERICAN FILE COMPANY *v.* NICHOLSON FILE COMPANY.

Mr. Wm. W. Douglas and Mr. Chauncey Smith for the complainant. Mr. Benj. F. Thurston for the defendant.

LOWELL, *J.:*

The facts set out in the bill and admitted by the demurrer are as follows: Etienne Bernot, of Paris, France, was the inventor of a new and useful machine for cutting files, and obtained letters patent therefor in France August 31, 1854, and in Great Britain March 27, 1855. On the 3d day of July, 1860, he applied for letters patent of the United States. They were granted him July 24, 1860, for fourteen years from that day. He assigned this American patent to George Somerville Norris, of Baltimore. In July, 1862, a private act of Congress was passed (12 Stats., 909) reciting the grant of the American patent, and enacting that it should be a valid grant for the full term of fourteen years from its date, notwithstanding the fact that it ought to have been granted only for the term of fourteen years from the date of the French patent. The second section provides that the title of Norris, the assignee, should be good and valid to vest in him the "exclusive right under the said patent for the full period of the term of fourteen years from the date of said patent in like manner and to the same extent as if the said patent when originally issued had been validly granted for fourteen years from the date thereof."

Bernot died in 1873, and his administrator, before the 23d day of July, 1874, presented his petition to the Commissioner of Patents for an extension of said letters patent, and the Commissioner did extend them accordingly for the term of seven years from July 24, 1874. They have been duly assigned to the plaintiff corporation, and the defendant has infringed upon the rights thereby granted.

The demurrer raises the question whether the Commissioner had power to extend this patent. The statute of 1836 (sec. 15, 5 Stats., 124) gave to every patentee the right to apply for an extension, and it was to be given him if he satisfied the official persons therein mentioned of certain facts touching his remuneration, etc., provided that no extension of a patent should be granted after the expiration of the term for which it was originally limited. This was the law until the act of March 2, 1861, by which the policy was adopted of granting patents for seventeen years, and not extending them under any circumstances, but this applied only to grants after March 2, 1861 (12 Stats., 249). When the statutes concerning patents were revised and consolidated in 1870, section 63 of the statute reserved the right to apply for an extension to all inventors whose patents were granted before March 2, 1861 (16 Stats., 208), and this is repeated in Revised Statutes, sections 4924 to 4928. The language of all these statutes is broad and makes no exception of persons who have taken out

patents in foreign countries, and it is admitted by the defendant that no discrimination was made at the Patent Office down to 1870, but that any inventor might have an extension who could prove the necessary facts, without regard to the question whether he held a foreign patent. Many such extended patents have been litigated, and no objection appears to have been taken to the power of the office to extend them.

By the law in 1836, and before and since, a patent can be granted, generally speaking, only to the original and first inventor, and the invention must not have been patented elsewhere or described in a printed publication. The statute of 1836, sec, 8 (5 Stats., 121), provided that nothing therein contained should deprive an original and true inventor of a right to a patent by reason of his having taken out letters patent therefor in a foreign country, and the same having been published at any time within six months next preceding the filing of his specification and drawings in this country. By the act of 1839, sec. 6 (5 Stats., 354), the lapse of six months after the invention had been patented abroad was declared not to be fatal, provided the invention had not been introduced into public and common use in the United States, and provided that all such patents should be limited to the term of fourteen years from the date or publication of the foreign letters patent.

32 We have no more doubt than counsel have that the general and broad provision for extending patents made no discrimination against those which were limited to fourteen years from the date of a foreign patent. Congress probably took for granted that all foreign patents were limited to fourteen years, and they intended that the American patent should expire with the foreign patent, but in respect to extensions they failed to legislate. Certainly there would be no justice in providing that an inventor who had been diligent enough to obtain a foreign patent should lose this right merely because the invention was free in foreign countries, when all inventions are free there if the inventors do not choose to patent them. They contented themselves with declaring that if an inventor had a monopoly abroad the original term here should coincide with what they assumed to be the term there.

In the revision of 1870, section 25, it is enacted that no person shall be debarred from receiving a patent for his invention, nor shall any patent be declared invalid by reason of its having been first patented in a foreign country, provided it shall not have been introduced into public use in the United States for more than two years prior to the application, and that the patent shall expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, but in no case shall it be in force for more than seventeen years. . (16 Stats., 201.)

We have already said that this same statute reserved to all inventors whose patents had been granted before March 2, 1861, the right to apply for an extension. (See sections 63 to 67.) The able and learned Commissioner of Patents, Mr. Fisher, who was in office for a short time after the statute was passed, held that, notwithstanding the broad language of sections 63 to 67 and though section 25

was not, in his opinion, retroactive, yet the law of 1870 had introduced a new policy to make all this class of patents free here when they became so abroad, and therefore, in the exercise of his discretion, he would not extend a patent which would expire abroad contemporaneously with its expiration here. (*Re* Mushet, C. D., 1870, 106; *Re* Ward, *ib.*, 126; *Re* Boyer, *ib.*, 130.) The defendant insists that the Commissioner was not only wise in this use of his discretion, if he had any, but that he had none to extend such a patent after 1870. We cannot admit the cogency of this reasoning.

There can be no reasonable doubt that Congress, in the statute of 1870, intended to leave patents granted before March 2, 1861, exactly where they were. They used apt language for this purpose, and if the Commissioner had power to extend any such patent before 1870 he had exactly the same afterward, for it is entirely clear that section 25 is not retroactive. The intent of Congress is fully carried out, because for all patents since March 2, 1861, there can be no extension, and therefore if they expire at the end of the earliest foreign patent that is the end of them. The fallacy lies in applying to old patents a policy which is in terms confined to new ones. The Patent Office reversed its decision in the same year, after Mr. Fisher had retired from office, and the reasoning of the later opinion appears to us sound. (*Re* Apperly, C. D., 1870, 163.) Even if the office should be thought to have exercised its discretion improvidently in this case, we have no power to reverse the decision.

Bernot's patent was granted in 1860, while the statute of 1839, sec. 6 (5 Stats., 354), was in operation. It should therefore have been limited to fourteen years from August 31, 1854, the date of the French patent. That was not done. If the private act of Congress had not been passed the patent would have expired August 31, 1868, because the law considered that to be done which should have been done and read the statute into the patent. (Morse *v.* O'Reilly, 15 How., 62.) In that event an extension could have been granted before the end of August, 1868, but not afterward. (*Re* Gessner, C. D., 1871, 48.) This decision is cited in the defendant's supplemental brief, as if it coincided with Mr. Fisher's ruling against extending a patent which is about to expire abroad. This is a misreading. The patent had expired two years before the application by the expiration of the foreign patent, under the decision in Morse *v.* O'Reilly, which is cited by the Commissioner as his authority in the premises.

Again, it is contended that the private act of Congress merely cured the defect arising out of the grant of the French patent, omitting, by inadvertence or design, all mention of the English patent, and therefore the American patent expired in 1869. If we were dealing with a patent issued since 1870 it would be true that if by any means the French grant and that only were re-
33 moved from the case the patent would yet expire with the English grant; but, as we have said, the law of 1839 required the Commissioner to limit Bernot's patent, not to the shortest term of any foreign patent, which might be three or five or ten years, nor to any term of foreign patents at all, but to fourteen years from the date of the foreign patent, and if there were two the term

should begin to run from the earlier, in this case the French, patent, and the existence of the later or English patent was immaterial; and when Congress said that Bernot's patent ought to have been limited to fourteen years from the date of the French patent they stated the case with entire accuracy and mentioned the only defect that exested.

Finally, it was argued that the act of Congress was a special exercise of sovereign power giving a prolonged term to the Bernot patent, and that as the act itself does not provide for an extension there can be none any more than there could be if the act had authorized an entirely new patent, which authority, being granted after the policy of non-extension had been established, in 1861, would carry with it no implied power of renewal; but upon this last supposition the grant would have been for a new term of seventeen years, and this was for the remainder of a term of fourteen years. We think the fair and obvious construction of the act is that the patent was to be considered a good grant for fourteen years from its date, with the right, of course, in the public to dispute its validity for want of patentability in the invention or want of novelty, and so on, and with the usual right of the patentee to procure an extension if the circumstances should justify the Patent Office in granting it, of which the Commissioner was the judge.

Demurrer overruled.

34 *Decree on Demurrer. Entered June 29th*, 1881.

Circuit Court of the United States. June Term, 1881.

RHODE ISLAND DISTRICT, *sc:*

THE NEW AMERICAN FILE COMPANY
vs.
THE NICHOLSON FILE COMPANY. } In Equity. No. —.

This cause came on to be heard at the present term upon the defendant's demurrer to the complainant's bill, and was argued by counsel; and thereupon, on consideration thereof, it is ordered, adjudged, and decreed as follows:

That the said demurrer be, and the same is, overruled, and the defendant required to answer to the bill of complaint within thirty days.

By the court:

HENRY PITMAN, *Clerk.*

June 29, 1881.

35 *Answer. Filed August* 31, 1882.

The answer of the Nicholson File Company to the bill of complaint exhibited against it.

This defendant, now and at all times saving and reserving unto itself all and all manner of benefit and advantage of exception that

may or can be had or taken to the many errors, uncertainties, insufficiencies, and imperfections in the complainant's said bill of complaint contained, for answer thereto, or unto so much and such parts thereof as it is advised it is material or necessary for it to make answer unto, answering, says:

This defendant admits that letters patent of the Empire of France were granted to Etienne Bernot on the 31st day of August, A. D. 1854, for certain improvements in machines for cutting files, as set forth in the bill of complaint, and that afterwards, to wit, on the 16th of October, A. D. 1854, letters patent for the same invention were granted to the said Etienne Bernot by the United Kingdom of Great Britain and Ireland, and that afterwards, to wit, on the 24th day of July, A. D. 1860, letters patent of the United States for the same invention were granted to the said Etienne Bernot, numbered 29236, as set forth in the bill of complaint; but this defendant denies that the said Etienne Bernot was the first and original inventor of the thing described in said letters patent of the United States, and denies that the same was not known or used before his supposed invention.

This defendant does not know and is not informed, save by the said bill of complaint, whether the said Etienne Bernot assigned the said letters patent so as aforesaid granted to him on the
36 24th of July, 1860, to one George Somerville Norris, as set forth in said bill, but leaves the complainant to prove the same as it may be advised.

This defendant admits that the certain special act of Congress approved July 16, 1862, recited at large in said bill of complaint, was passed at the second session of the Thirty-seventh Congress, as charged in said bill.

This defendant is not informed, save by the said bill of complaint, whether the said Etienne Bernot died on the 25th of September, 1873, or whether letters of administration were duly taken out according to law in the State of Rhode Island by one Charles A. Nichols, but leaves the complainant to prove the same as it may be advised.

This defendant admits that the said Charles A. Nichols, assuming to act as the administrator of the said Etienne Bernot, did apply for an extension of said letters patent prior to the 23d day of July, 1874, and that such proceedings were had in the premises that the then Commissioner of Patents assumed under a supposed power vested in him to grant an extension of said letters patent for the term of seven years from and after the supposed date of expiration of the original term of fourteen years—that is to say, for the period of seven years from the 24th of July, 1874.

This defendant is not informed, save by the said bill of complaint, whether the heirs-at-law of the said Etienne Bernot assigned the extended term of said patent to the said Charles A. Nichols or whether the said Nichols on December 1, 1876, assigned the same extended patent to the complainant in this case, and requires the said complainant to make due proof thereof.

And this defendant submits to this honorable court that the act

of the Commissioner of Patents in assuming to extend the said Bernot patent for the term of seven years from the 24th day of July, 1874, was illegal and void, for the reason that the said Bernot patent had expired long before the granting of such extension,
37 to wit, at the expiration of fourteen years from August 31, 1854, the date of the letters patent to the said Bernot from the government of France.

And for the further reason that under the special act of Congress approved July 16, 1862, set forth in the bill of complaint, no authority was conferred upon the Commissioner of Patents to grant such extension for any term or period beyond the term limited in said special act.

And for the further reason that because the said Bernot did, as alleged in said bill of complaint, procure letters patent for the same invention for the United Kingdom of Great Britain, &c., on the 16th day of October, 1854, the said United States letters patent procured by him more than six months after the date or publication of such English letters patent expired under the laws in force when said patent was granted, on the 16th day of October, 1868.

And for the further reason that the special act of Congress approved July 16, 1862, did not save the said Bernot patent for the United States from the limitation as to its duration in consequence of such previously obtained letters patent for Great Britain, &c.

And for the further reason that the original term of said Bernot letters patent for the United States expired August 31, 1868, and such patent was an expired patent under the general laws relating to patents long before the 23d day of July, 1874, and the Commissioner of Patents was prohibited by law from granting an extension of letters patent after the expiration of the original term of the same.

And for the further reason that the said Etienne Bernot procured letters patent, as this defendant avers and will prove, for the Kingdom of Belgium for the same invention, which letters patent were dated the — day of ——, A. D. 1854, and by force of the statutes existing on the 24th day of July, 1860, the time when the
38 said letters patent of the United States were granted to the said Bernot, such United States letters patent being for the same invention and founded upon foreign letters patent procured more than six months prior to the application for the said letters patent for the United States expired on the — day of ——, 1868, and the Commissioner of Patents had no authority under the general laws relating to letters patent in force July 23, 1874, to grant an extension of the said United States Bernot letters patent.

And for the further reason that the special act of Congress approved July 16, 1862, set forth in the bill of complaint, did not save the said United States Bernot patent from the limitation as to its duration imposed by the fact that letters patent had been previously taken out for the same invention in the foreign country of Belgium.

Aud for the further reason that under the acts of Congress in relation to letters patent for inventions in force July 23, 1874, no power or authority was conferred upon the Commissioner of Pat

ents to extend any United States letters patent founded upon an invention which had been previously patented in a foreign country in case such foreign letters patent had expired.

And this defendant avers that the title of the complainant to the said extended Bernot patent did not accrue to it until the 1st day of December, A. D. 1876, and that the said complainant has no right or title to prosecute for any supposed infringement upon or violation of said United States Bernot patent prior to said last-named date, which date is subsequent to the unlawful exercise of authority on the part of the Commissioner of Patents in assuming to grant an extension of said United States letters patent from and after the 24th day of July, 1874.

And this defendant, further answering, denies that it has made, sold, and used, and still does make, sell, and use, any machine for cutting files substantially the same as that described in the said Bernot letters patent so as aforesaid granted by the United States
39 on the 24th day of July, 1860, No. 29236, or that it has in any manner infringed upon said letters patent or violated or invaded any right which the complainant has therein or to the invention covered thereby.

And this defendant, further answering, says that the said Etienne Bernot was not the original and first inventor of the thing patented in and by his said letters patent of the United States, but that the same had been patented prior to his supposed invention or discovery thereof in the following-named letters patent of prior date:

Letters patent of Great Britain, &c., to William Nicholson for machinery for the manufacture of files, dated August 14th, in the 42nd year of the reign of George III, being No. 2641 of the year 1802.

Letters patent of Great Britain, &c., to William Edward Newton for machinery for cutting files, dated July 23, 1850, being No. 13193 of the year 1850.

Letters patent of Great Britain, &c., to Robert Craib Ross for an improved machine or instrument for cutting files and forging metal, dated March 4, 1853, being No. 545 of the year 1853.

Letters patent of Great Britain, &c., to Thomas Waterhouse for improvements in machinery for cutting files, dated August 8, 1854, being No. 1732 of the year 1854.

Letters patent of Great Britain, &c., to William Edward Newton for improved machinery for cutting files and rasps, dated August 18, 1854, being No. 1809 of the year 1854.

Letters patent of the United States granted to Levi Anderson, dated November 16, 1841.

Letters patent of the United States granted to John Crum for improvements in machinery for cutting files, dated July 1, 1851, No. 8199.

Letters patent of the United States granted to Conklin, Sidman & Whitner, dated August 17, 1852.

40 Letters patent of the United States granted to Horace Hotchkiss for improvement in machines for making files, dated July 2, 1855.

Letters patent of Great Britain, &c., to Francis Preston and Wil-

liam Macgregor for machinery for forging and cutting files, dated April 15, 1858, being No. 815 of the year 1858.

Letters patent of Great Britain, &c., to William Edward Newton for machinery for cutting files, dated June 22, 1857, being No. 1740 of the year 1857.

Letters patent of Great Britain, &c., to William Edward Newton for machinery for cutting files, dated January 22, 1859, being No. 205 of the year 1859.

Letters patent of the United States granted to Milton D. Whipple for improvement in machinery for cutting files, dated February 1, 1859, No. 22842.

Letters patent of the United States granted to Milton D. Whipple for an improvement in the manufacture of files, dated June 26, 1860, No. 28947.

Letters patent of Great Britain, &c., to Louis Schwartzkopff and Ferdinand Carl Philippson for improvements in steam hammers and in machines for cutting files and for planing and grooving iron, stone, and other substances, dated July 6, 1859, being No. 1607 of the year 1859.

Letters patent of the United States granted to Charles Miller and Thompson W. Decker, assignors to Thomas W. Decker, for improvements in machinery for cutting files, dated April 12, 1859, No. 23645.

Letters patent of Great Britain, &c., to William Clark for improvements in machinery for cutting files, dated June 28, 1860, being No. 1571 of the year 1860.

Letters patent of the United States granted to James C. Cooke for an improved machine for cutting files, dated July 10, 1860, No. 29130.

41 And this defendant, further answering, says that the said letters patent of the United States granted to the said Etienne Bernot, dated July 24, 1860, No. 29236, were granted under the authority of the act of Congress approved July 4, 1836, and the act in amendment thereto, approved March 3, 1839, and that the invention described in said letters patent had been previously patented in divers foreign countries, to wit, in the Empire of France under date of August 31, 1854, in the United Kingdom of Great Britain and Ireland under date of October 16, 1854, and in the Kingdom of Belgium under date of —— —, 1854; and this defendant avers that the invention described in said United States letters patent, or substantial and material parts thereof, had been introduced into public and common use in the United States prior to the application of the said Etienne Bernot for the said letters patent of the United States; and this defendant avers that the date of the application of the said Bernot for his said United States letters patent was the 3rd day of July, 1860; wherefore this defendant insists that the said letters patent of the United States so as aforesaid granted to the said Etienne Bernot on the 24th day of July, 1860, are void and of no effect.

And this defendant, further answering, says that the said Etienne Bernot was not the original and first inventor of the thing described

in his said letters patent of the United States so as aforesaid granted on the 24th day of July, 1860, and numbered 29236, but that the same or a substantial and material part thereof was known to and used by the following-named persons prior to the invention or discovery thereof by the said Bernot, whose names and residences and the places where such knowledge and use was had are as hereinafter next stated:

John Crum; residence, Ramapo, New York; place of use, at said Ramapo.

Edward H. Crum; residence, Ramapo, New York; place of use, at said Ramapo.

42 Eugene Whritner; residence, Sufferns, New York; place of use, at Ramapo, New York.

Abram Acker; residence, Paterson, New Jersey; place of use, at Ramapo, New York.

David S. Dodge; residence, New York city, New York; place of use, at Ramapo, New York.

Henry L. Sidman; residence, Hudson City, New Jersey; place of use, at Ramapo, New York.

And by many other persons in the employ of the American File Company, a company formerly located at Ramapo, in the State of New York, and by various persons in the employ of the Whipple File Company, a company formerly located at Ballardvale, in the State of Massachusetts, and also at Boston, in said State, and by many other persons, whose names and residences are now unknown to this defendant, but which when ascertained it prays leave to insert in this its answer.

And this defendant, further answering, says that in view of the state of the art known prior to the alleged invention of the said Etienne Bernot in machinery for making files, and also in analogous machinery in the arts relating to the working of wood and other materials, so much of the alleged invention of the said Bernot as is described in the said letters patent of the United States, dated July 24, 1860, No. 29236, and recited particularly in the third claim thereof, does not exhibit any patentable quality or proper subject of invention, and this defendant, in support of this averment, will refer particularly to the hereinbefore mentioned—

English letters patent to William Nicholson, dated August 14, 1802, being No. 2641 of the year 1802.

English letters patent to William Edward Newton, dated July 23, 1850, being No. 13193 of the year 1850.

English letters patent to Robert Craib Ross, dated March 4, 1853, being No. 545 of the year 1853.

43 English letters patent to Thomas Waterhouse, dated August 8, 1854, being No. 1732 of the year 1854.

English letters patent to William Edward Newton, dated August 18, 1854, being No. 1809 of the year 1854.

United States letters patent granted to Levi Anderson, dated November 16, 1841.

United States letters patent granted to John Crum, dated July 1, 1851, No. 8199.

United States letters patent granted to Conklin, Sidman, and Whritner, dated August 15, 1872.

And this defendant will also prove that in the art of planing and dressing lumber machinery was employed in general use in the United States for many years before the supposed invention of the said Etienne Bernot, wherein was employed a stationary bed upon which the article to be planed or dressed to a determined thickness was placed, a cutting tool for working on the surface of such lumber, and a pressure device for holding the lumber to be dressed down to the bed and parallel with the cutter's edge, such pressure device being sometimes a roller and sometimes a pressure bar, and that such combination of devices in the analogous art of dressing lumber to a uniform thickness was the substantial equivalent of the combination claimed in the said Bernot patent, and the elements employed in such combination were substantially the same as the elements in the corresponding combination in the said Bernot United States letters patent, and this defendant in this connection will refer to the letters patent of the United States granted to William Woodworth for an improvement in machine for planing, tonguing, and grooving and dressing boards, &c., dated December 27, 1828, and reissued July 8, 1845, No. 71, and to the letters patent of the United States granted to Joseph P. Woodbury for an improvement in planing machines, dated April 29, 1873, No. 138,462.

44 And this defendant further avers and will also prove that machinery for planing lumber containing the combination of a cutting tool, stationary bed, and yielding pressure bar was in public use in the city of Norwich, in the State of Connecticut, as early as the year 1843, long prior to the supposed invention of the said Etienne Bernot, and that such prior knowledge and use at the said city of Norwich will be proved by the following-named persons, whose names and residences are as hereinafter next stated:

Alfred Anson, of Milan, New York.
Noah L. Cole, of Norwich, Connecticut.
Daniel W. Gardner, of Brooklyn, New York.
Henry H. Peck, of Vineland, New Jersey.
Thomas O. Cutler, of Jersey City, New Jersey.
Edward F. Bliss, of South Hadley, Massachusetts.
Horace S. Gates, of Norwich, Connecticut.
Albert A. Bailey, of Norwich, Connecticut.
Waitstill Avery Strickland, of New London, Connecticut.
Beriah S. Rathbun, of Norwich, Connecticut.
Courtland Pendleton, of Preston, Connecticut.
Joshua Griffith, of Chatham, Connecticut.
Gilbert L. Congdon, of Norwich, Connecticut.
William H. Copp, of Norwich, Connecticut.
George E. Brown, of Norwich, Connecticut.
Elijah M. Pellett, of Norwich, Connecticut.
Frederick W. H. Rogers, of Chicago, Illinois.
Titus Carrier, of Norwich, Connecticut.

And this defendant further avers and will also prove that ma

chinery for planing lumber, containing the combination of a cutting tool, stationary bed, and yielding pressure bar, was in public use in this country long prior to the supposed invention of the said Etienne Bernot, and that such knowledge and use will be proved by the following-named persons, whose names and residences and
45 the places where such knowledge and use were had are as hereinafter next stated:

Enos G. Allen; residence, Boston, Massachusetts; place of use at Templeton, Massachusetts.

Samuel E. Bunn; residence, Templeton, Massachusetts; place of use at said Templeton.

Abiel Gates; residence, Templeton, Massachusetts; place of use at said Templeton.

Henry F. Lee; residence, Manchester, Massachusetts; place of use at said Manchester.

James N. Buffum; residence, Lynn, Massachusetts; place of use at said Lynn.

And this defendant, further answering, says that the said Etienne Bernot has, in the specification of the said letters patent of the United States, granted to him July 24, 1860, No. 29236, claimed to be the first and original inventor or discoverer of divers material or substantial parts of the thing patented, of which he was not the first and original inventor or discoverer, and the specifications of said patent embrace more than that of which the patentee was the first and original inventor or discoverer; and this defendant avers that the said patentee, his executors, administrators, and assigns, have neglected for the period of twenty-one years to enter a disclaimer of such parts of the thing patented as were not justly and truly the invention of the said Etienne Bernot, whereby and for the reason that such neglect has existed during the whole period for which such letters patent were originally granted and extended this defendant submits that the said patentee, his executors, administrators, and assigns, have been guilty of unreasonable neglect, and that the complainant has no right in law or in equity to prosecute this suit.

And this defendant claims the benefit of all matters set up in its answer and which could have been set up by demurrer to the
46 bill or by plea to any part thereof with the same effect as if it had demurred to said bill or had pleaded such matter in bar of this suit.

And this defendant denies all and all manner of unlawful combination and conspiracy wherewith it is by said bill of complaint charged, without this, that there is any other matter, cause, or thing in said complainant's said bill of complaint contained material or necessary for this defendant to make answer unto and not herein and hereby well and sufficiently answered, confessed, traversed, and avoided or denied is true to the knowledge and belief of this defendant; all which matters and things this defendant is ready and willing to aver, maintain, and prove as this honorable court shall direct, and humbly prays to be hence dismissed with its

reasonable costs and charges in this behalf most unjustly and wrongfully sustained.

NICHOLSON FILE CO.,
By GEORGE NICHOLSON, *Treas.*

BENJ. F. THURSTON, *Of Counsel.*

UNITED STATES OF AMERICA,
District of Rhode Island, } *sc:*

George Nicholson, being duly sworn, deposes and says that he is the treasnrer of The Nicholson File Company, the defendant corporation named in the foregoing answer; that he has read the said answer and knows the contents thereof, and that the same is true of his own knowledge except as to the matters therein stated on information and belief, and as to those matters he verily believes it to be true.

GEORGE NICHOLSON.

Subscribed and sworn to before me this 31st day of August, A. D. 1881.

WILMARTH H. THURSTON,
Notary Public.

47 *The Replication of The New American File Company, Complainant, to the Answer of The Nicholson File Company, Defendant. Filed Sept.* 12, 1882.

This repliant, reserving unto itself all and all manner of advantage of exception to the manifold insufficiencies of the said answer for replication thereunto saith that it will aver and prove its said bill to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant, without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver and prove as this honorable court shall direct, and humbly prays as in and by its said bill it hath already prayed.

By its solicitors, W. W. & S. T. DOUGLAS.

48 Circuit Court of the United States, District of Rhode Island, *sc:*

THE NEW AMERICAN FILE CO.
vs.
THE NICHOLSON FILE CO. } In Equity. No. 1007.

Depositions of witnesses produced on behalf of the complainant taken before A. J. Cushing, notary public, at Providence, Rhode Island, on the 30th day of October, A. D. 1882, by virtue of the agreement hereto annexed.

Present: Wm. W. Douglas and Chauncey Smith, for complainant and B. F. Thurston, for defendant.

EDWARD E. QUIMBY, a witness called on behalf of the complainant, being duly sworn, on oath doth depose and say, in answer to the following interrogatories, as follows:

Direct examination by CHAUNCEY SMITH, Esq.:

Q. 1. What is your name, age, residence, and occupation?

49 A. My name is Edward E. Quimby; I am in the fifty-second year of my age; reside in Orange, and have my office in New York.

I am a mechanical engineer, but have been chiefly occupied for many years as a solicitor of patents and an expert in patent causes.

Q. 2. What has been your experience and what have been your opportunities for fitting yourself as an expert in patent causes?

A. I have been more or less connected with manufacturing enterprises for a period of about thirty years.

I have heretofore designed and superintended the construction and operation of machinery for various purposes. I am familiar with patents, and have often been employed to examine patents relating to the different mechanic arts and to investigate and report concerning the differences or resemblances between the structures shown and described in the patents which were the subjects of my examination and structures shown and described in patents and publications of prior date.

I have drawn the specifications and claims of patents. I have often testified as an expert in patent causes, and have been and am now extensively occupied as an arbitrator in questions relating to inventions and patents.

Q. 3. If you have examined letters patent of the United States No. 29236, dated July 24th, 1880, granted to Etienne Bernot for an improved machine for cutting files, please explain that part of the machine which you understand to be the subject of the third claim, the function it performs, and the relation it bears to the other parts of the machine and to the practical working of the machine in cutting files.

A. The file-cutting machine shown and described in the Bernot patent, which for convenience I shall speak of as the Bernot ma-

chine, belongs to that class of file-cutting machines in which the file blank, which is fed longitudinally by a step-by-step movement across the path of a reciprocating chisel or cutter, is supported upon a bed which, as the capacity of rolling or rocking side-
50 wise in order to adapt the surface of the file blank which is to be cut to the line of the cutting edge of the chisel.

The part of the machine which is the subject of the third claim is an adjustable weighted presser foot, the thin lower edge of which bears upon the top of the file blank in a line extending across the blank, which is slightly in advance of the path of the cutting edge of the chisel. As the blank slides along under the presser foot the rocking bed yields as may be required by variations in the thickness of the blank. If one side of the blank is thicker or higher than the other that side is pressed downward, and the oscillation of the bed brings up the other side into contact with the presser foot. The presser foot, which is called in the patent "guide," is made adjustable in order that it may be so set with relation to the chisel as to bring the part of the surface of the blank upon which the chisel is to operate at any given time into a condition of parallelism with the cutting edge of the chisel preparatory to receiving the blow of the chisel, so that the cut, when made, will be of uniform depth at both ends.

Previous to Bernot's patent there were file-cutting machines with rolling beds for the support of the blank, but without Bernot's weighted presser foot or parallel guide.

In such machines the blow of the chisel was alone depended upon to rock the bed as required by the exigencies of the work, such as inequalities of the surface due to the imperfect grinding of the blank or symmetrical variations in the thickness of the blank. Thus a blank which tapers in thickness is thinner at one end of the diagonal cut than it is at the other end, and the bed requires to be so rocked as to bring the thinner edge up to a level with the thicker edge. When the blank swells in thickness in the middle the differences in thickness at the opposite ends of the diagonal cuts gradually diminish until the middle is reached, where the thickness is the same at both ends of the diagonal cut. After the middle is passed the differences reappear, but in reversed order. What
51 was the thinner side of the blank at the end of the cut is now the thicker side. In dealing with blanks which taper in their thickness, therefore, the bed requires to be rocked step by step in the same direction from the beginning to the end of the cutting operation. In the old machines, in which the only provision for rocking the bed was by the blow of the chisel, the higher edge of the blank would be struck first by the descending chisel, and would, of course, receive a deeper cut than the lower edge, which would not be reached by the chisel until after the force of the blow had been partially expended in cutting the higher edge and in rocking the bed.

The object of the part of Bernot's machine to which the question relates was to overcome this difficulty by insuring the proper parallelism of the surface of the blank before it was struck by the chisel,

so that the nick would be made of uniform depth at both ends. This Bernot effected by his weighted presser foot or guide capable of being set parallel with the cutting edge of the chisel and bearing upon a line extending across the blank, in close proximity with the line extending across the blank which was to receive the next blow of the chisel.

The parts of a file-cutting machine essential to the operation of Bernot's contrivance are a rolling bed for supporting the blank, means of feeding the blank longitudinally by a step-by-step movement, and a reciprocating chisel.

Referring to Bernot's specification and to the drawings illustrating his contrivance, I find his presser foot is in the form of a beveled plate projecting laterally and downwardly from the lower end of a sliding bar, called in the specification the "guide" U, which is seated in a dovetailed groove formed in the face of an adjustable disc, p^1, which is pivoted to a stationary disc, p, by a pinion bolt, s, which projects through the stationary disc and is provided with a nut, l. A stud, r, affixed to the plate, p^1, projects outwardly through a slot, q,
52 in the stationary plate p, and has a screw-thread cut upon it to receive a jam nut, t, for clamping the plates p and p^1 together. The pin s forms the horizontal axis upon which the plate p^1 can be oscillated when the nut t is loosened. The object of making the plate p^1 thus adjustable is to provide for setting the presser foot into the proper relation with the cutting edge of the chisel. The dovetailed groove in the plate p^1 provides for the up-and-down movement of the slide bar U, to which the presser foot is fixed, and this bar, of course, partakes of the lateral movement of the disc p^1, whenever that is adjusted, by oscillating it one way or the other, as may be required. Near the upper part of the slide bar or "guide" U there is a laterally projecting stud V, which is loosely inserted through the weighted lever x, provided at its free end with a weight D^1, and pivoted at its opposite end to the upper end y of a short link, the lower end z of which is pivoted to the stationary plate p.

When the cutting operation is going on the presser foot is held constantly down upon the surface of the blank by the weighted lever. If it be found that the cutting edge of the chisel is not perfectly horizontal, which might happen from inexact grinding or from the inexact setting of the chisel in the lower end of the slide P Q, which carries it, the nut t is loosened and the plate p^1 is then oscillated until the rocking bed, under the action of the presser foot, is made to assume such a position as to present the part of the blank which is immediately under the chisel in a plane parallel with the cutting edge of the chisel. The nut t is then tightened, thus clamping the plate p^1 and insuring the continuance of the bearing edge of the presser foot in the condition of inclination to which it may have been adjusted. Thereafter the rolling or rocking of the bed in such manner as to present the part of the surface of the blank which is to be cut in the proper condition of parallelism with the cutting edge of the chisel, so that the nick when made will be of like depth at both ends, will be automatically effected and con-

trolled by the bearing of the presser foot upon a part of the
53 blank so near the part which is being cut as to have practically the same conditions of variability in thickness or inequality of surface as the part which is being cut has. The presser foot is the guide which controls the direction and the range of oscillation of the rolling bed as the blank is fed along beneath it.

The function of the mechanism which I have described at length and which forms the subject of the third claim of the Bernot patent is concisely stated in Bernot's specification (page 13, printed copy) in the following words, namely:

"Owing to the peculiar arrangement of this part of the machine, when the guide U is once regulated by the counter plate or disc in which it slides it acts as a press and guide at the same time—that is to say, it always forces the file upon which it rests during the cutting operation to keep parallel to the graver N^1, by which the cutting is performed."

I understand that Bernot's contrivance of the adjustable guide is indispensable to the successful working of a file-cutting machine, and that it was the thing which first enabled such machines to produce files with cuts of uniform depth at both ends.

Q. 4. Are you familiar with the file-cutting machine shown and described in letters patent of the United States, No. 42216, dated April 5th, 1864, granted to William T. Nicholson, of Providence, R. I.?

A. I have known for some years of the patent referred to in the question. On the 6th day of July, 1888, by arrangement of counsel in this case, in company with Messrs. Chauncey Smith and W. W. Douglas, I visited the works of the Nicholson File Company, at Providence, R. I., on which occasion I saw in practical operation large numbers of file-cutting machines, which, excepting as to the mechanism for guiding the blank, were substantially like that shown and described in the said Nicholson patent.

Q. 5. If you observed an arrangement of mechanism in the said Nicholson machines for controlling the presentation of the
54 file blank to the chisel, state what differences or resemblances exist between such mechanism and that which you find to be the subject of the third claim of the Bernot patent.

A. The said Nicholson machine contains all the ingredients of the arrangement of mechanism which forms the subject of the third claim of the Bernot patent. The file blank is supported upon a rocking bed and is fed by a step-by-step movement across the path of a reciprocating chisel, and the rocking of the bed, and consequently the presentation of the surface of the blank to the chisel, is effected and controlled by a presser foot or guide having its bearing across the surface of the blank in close proximity to the part of the blank which is being cut. In the Nicholson machine the chisel is made adjustible instead of the presser foot, but this is a mere formal difference. The Nicholson chisel is secured to its stock by a set screw and is capable of adjustment in its stock when the set screw is loosened. The chisel stock is fastened in the sliding frame, which carries it by a jam nut, and by loosening this nut the stock can be

turned upon its vertical axis, thus changing the adjustment of the chisel with relation to the surface of the blank immediately beneath the cutting edge of the chisel. The path along which the blank is fed is inclined with relation to the vertical path in which the chisel reciprocates. If, therefore, the part of the blank near the presser foot immediately under the chisel is found to be not quite parallel with the cutting edge of the chisel a slight rocking of the chisel in its stock or a slight turning of the stock in the required direction will bring about such parallelism and thus set the chisel in the proper relation to the presser foot. This amounts to the same thing as setting an adjustable presser foot in the proper relation with the chisel.

In my opinion, the guiding and cutting mechanism of the Nicholson machine is the same in its purpose, relative arrangement, and mode of operation as the mechanism which is the subject of the third claim of the Bernot patent. In the Nicholson machine, as in
55 the Bernot machine, after the proper adjustment has been had the presser foot or guide, acting upon inequalities in the surface of the blank or upon parts of the blank of variable thickness, causes the bed to rock as may be required, so that the parts of the surface of the blank which are to be cut are successively brought into a condition of perfect parallelism with the cutting edge of the chisel preparatory to receiving the blow of the chisel. The result follows that the nicks are all of like depth at both ends.

Q. 6. Have you examined the duplicate of the model as it now appears in the matter of the letters patent granted Etienne Bernot July 24, 1860, No. 29236, for improved machine for cutting files, with the certificate of the acting Commissioner of Patents annexed? And, if yea, please state whether you find embodied in the said model the arrangement of a guide set parallel to the graver shown and described in the Bernot patent aforesaid and particularly referred to in the third claim thereof?

A. I have examined the model referred to and I find in it an adjustable guide constructed in accordance with the description contained in the specification of the Bernot patent and according to the drawings of the said patent. The arrangement of the guide in the model is that which is referred to in the third claim of the Bernot patent. I notice in figure 4 of the Bernot patent a slight error in the drawing, which consists in representing the stud r, which is called in the patent the "axis" r, as being inserted into the vertical sliding guide U instead of terminating in the disk p^1 at the bottom of the groove in which the dovetailed guide U slides. The description of the structure contained in the specification is perfectly plain, and I do not think that a skilled mechanic with the description and drawings before him would fail to perceive the error in question, or would be misled by it, or would have any difficulty in constructing the adjustable guide mechanism in operative form. With
56 the drawings and specifications before him a skilled mechanic could construct the adjustable guide mechanism contained in the model.

Q. 7. Will you please state whether or not you find that the model is

different in any respect as to its other features from the machine described and represented in the patent? And, if so, please point them out briefly and state whether or not the device referred to in the third claim is in any way affected as to its function or mode of operation by such differences.

A. There are some trifling differences between the model and the drawings attached to the patent, such as the location of the rock shaft which transmits motion to the pawl for rotating the screw which moves the bed upon the opposite side of the bed from that in which it is represented in the drawings, but there are no differences in the model which in any way affect the function or mode of operation of the device referred to in the third claim of the patent.

Cross-examination by B. F. THURSTON, Esq.:

Cross-Q. 8. The third claim of the Bernot patent, which, in your opinion, is infringed by the defendant's machine, is in the words following, viz: "Thirdly. In the arrangement of a guide set parallel to the graver, as hereinbefore described and referred to in figures 1 and 2, drawing I, and figure 2, drawing II." What is specifically the "hereinbefore described" arrangement shown in said Bernot patent and drawings?

A. A bar, the lower end of which is provided with a sharp-edged lateral projection, which is the presser foot, while its upper end is pivoted to a weighted lever. This bar slides in a dovetailed groove formed in a plate called in the patent the disk p^1, which plate or disk is pivoted to the lower part of another plate, which is bolted to the frame of the machine. The inner plate or disk p^1 is pro-
57 vided with a horizontal axis of oscillation by means of the pivot which secures it to the outer plate. This pivot is the screw s of figure 2, drawing I. To fasten the inner plate or disk p^1 in the position to which it may have been oscillated upon its pivot in order to obtain the desired alignment of the groove in which the presser bar slides it is provided with a screw bolt, which projects outwardly through a horizontal slot in the outer plate. As the inner plate or disk p^1 oscillates upon its pivot s the screw bolt, which is lettered "r" in figure 2, drawing II, describes in its motion an arc of a circle, of which the pivot s is the center. The outwardly projecting portion of the screw bolt "r" is provided with a nut, "t," by the tightening of which the inner plate or disk p^1 and the outer plate are clamped together.

Cross-Q. 9. In your opinion, it is necessary, is it not, that the so-called guide should be adjustable relatively to the chisel edge?

A. It is necessary, unless the chisel should be made adjustable, in which case the guide need not be adjustable.

Cross-Q. 10. That is to say, the guide or presser and the chisel should be relatively adjustable to each other, in your opinion?

A. That, I think, is another way of stating what I have stated in my preceding answer.

Cross-Q. 11. In your deposition you have undertaken to describe the construction of the Bernot machine with reference to that part

which becomes material, as forming the foundation for the subject of the third claim. Were you able, when you gave the deposition, to understand from the patent itself the construction of the disk, the plate p^1, and guide "U," without referring at all to any machine which has been constructed by the complainant?

A. Yes, sir. My impression is that I formed my conclusion as to the construction of the part of the machine referred to from an inspection of the drawings and an examination of the specifications of the patent before I saw any machines constructed after the patent and before I examined this model. The first time that I ever examined this model by taking it apart was this morning.

58 Cross-Q. 12. What meaning do you give to the words occurring in the specification referring to the subject of the third claim and which are "this groove is made so as to allow the axis of a counter-plate to slide from right to left on it and to describe in its motion an arc of a circle, of which the point *s* is the centre," etc.?

A. The thing called "axis" in the specification is the thing lettered "*r*" in figure 2, drawing I, and also in figure 2, drawing II, excepting so far as to the error to which I referred in my direct testimony, and that thing is the screw bolt, inserted through the oscillating plate or disk p^1 and projecting outwardly through the slot in the outer plate to receive the clamping nut *t*. I understand that the thing *r*, by reason of its connection with the inner plate or disk p^1, moves in the arc of a circle, of which the axis of the oscillating disk, or, in other words, the pivot *s*, is the center.

Cross-Q. 13. Is it anywhere stated in the specification or shown in the drawing that the guide U is seated in a dovetailed groove formed in the face of an adjustable disk, p^1? If so, refer to the passage of the specification and to the figure of the drawing.

A. The specification does not contain the descriptive language set forth in the question. In the specification the presser bar is described as the "dovetailed guide sliding freely in the disk p^1." It is clear to my mind that a presser bar like the presser bar shown in the drawings and which is described in the specifications as "dovetailed" must, as a matter of course, be provided with a dovetailed groove in which to slide.

Cross-Q. 14. Is it anywhere stated in the specification or exhibited in the drawing that the hole through which the pin passes to receive the clamp nut *t* is slotted or made larger in diameter than the pin, and if not so constructed would there be any capacity of adjustment existing?

A. The term "slotted" is not employed in the part of the specification describing the structure referred to. The statement about it in the specification is that "this groove is made so as to

59 allow the axis of the counter-plate to slide from right to left on it and to describe in its motion an arc of a circle, of which the point *s* is the centre." The word "axis" in the sentence which I have quoted means the screw bolt "*r*," which the drawing shows as projecting outwardly through the exterior plate.

It is therefore clear to my mind that the term "groove" used in

the specification refers to the aperture in the exterior plate, through which the screw bolt *r* passes, and it is clear that this aperture is enlarged horizontally, because, according to the specification, the screw bolt "*r*" slides from right to left, describing in its motion an arc of a circle, of which the pivot *s* is the center. An aperture in the exterior plate, so enlarged as to permit this "right-and-left" movement of the screw-bolt "*r*" in the arc of a circle, is properly described by the term "slot," which I used in my answer to the cross-question.

Cross-Q. 15. Suppose there were substituted in the Bernot machine, in place of the form of the presser or guide shown, a cylinder, the axis of which was as long as the widest part of the guide or presser, the machine in other respects remaining the same, excepting so far as necessities of formal change would be required by the substitution of the cylindrical roller-presser or guide, would such a modification contain, in your judgment, the subject of the third claim?

A. If, as suggested in the question, a long horizontal roller should be mounted upon the lower end of the presser bar the structure would not possess all of the advantages of the organism shown in the Bernot patent. The effect of substituting the roller would be to remove the bearing point of the presser from that position of close proximity to the chisel which the bearing place of the Bernot presser foot has. The further the bearing place of the presser foot is removed from the part of the blank that is being cut the greater is the liability of a failure to perfectly present the part of the blank immediately under the chisel in a position of parallelism with the cutting edge of the chisel. An inequality in the surface of the blank in contact with the roller might not extend so far as the part of the blank immediately under the chisel, and while the long roller suggested would, in its mode of operation, have some of the characteristics in the Bernot machine in respect of controlling the position of the rolling bed, it would fall so far short of the perfection of operation of the Bernot presser foot in respect of controlling the position of the rolling bed by means of pressure exerted upon the part of the blank in close proximity with the part immediately under the cutting edge of the chisel that I think it may be open to doubt whether the modification suggested in the question is within the description of the device shown and described in the Bernot patent, and particularly referred to in the third claim thereof. The answer to the question, of course, depends upon the construction which the court may give to the third claim, taken in connection with the drawings and specification of the Bernot patent and having in view whatever may be the prior state of the art.

Cross-Q. 16. To relieve your mind of any apprehension as to how your answer to the preceding question would appear in view of any prior state of the art hereafter to be proved, I will, for the present in this question, assume that the Bernot machine was the first file machine ever made; and now answer whether the modification suggested is included in the third claim in your opinion.

A. Upon the assumption mentioned in the question, and without withdrawing my opinion that the modification suggested would constitute a feeble and inefficient embodiment of the Bernot invention, I incline to the opinion that the modification in question would be an infringement of the Bernot patent.

Cross-Q. 17. Do you not understand that the Bernot combination specified in the third claim involves a construction in which the presser shall control absolutely the position of the blank
61 transversely, and the face of the same at the point of contact be always parallel with the face of the presser?

A. Yes; I understand that to be so.

Cross-Q. 18. Do you not understand that the object of the combination recited in the third claim is to enable the cut made by the chisel in the blank in forming the tooth to be of equal depth at both ends by reason of the parallelism between the face of the presser and the face of the chisel?

A. Yes, sir.

Cross-Q. 19. In the Bernot machine is not the bed of the machine in which the rolling bed is deposited constructed so that it can be turned to the right or left in a plane parallel with or intersecting the plane of the horizon?

A. Yes; the bed referred to in the question is provided with a horizontal axis of rotation, and is carried in a frame having a vertical axis of rotation.

Cross-Q. 20. Is not the construction referred to in the question to enable the file blank to travel during the process of cutting in a path which is at such an angle with the face of the chisel as may be desired to produce diagonal cuts over the surface of the blank?

A. Yes.

Cross-Q. 21. Is the diagonal cut upon the surface of the blank in forming the teeth obtained in the defendant's machine by turning the bed laterally to the right or left as in the Bernot machine or by turning the chisel to the right or left upon its vertical axis?

A. It is obtained by adjusting the chisel upon its vertical axis to the required position.

Cross-Q. 22. At what angle does the face of the chisel or the face of the presser stand to the stocks of such implements in the Bernot machine, as represented in the model, patent, and drawings; is it not at a right angle therewith?

A. Substantially at a right angle with the vertical axis of the stocks.

62 Cross-Q. 23. In the defendant's machine is not the face of the presser, as well as the face of the cutting tool, formed at an angle with the vertical axis of their stocks, in order to enable the oblique up-cut or over-cut to be made on a file blank?

A. Yes.

Cross-Q. 24. In the defendant's machine you have said that the presser was a fixture, and that the cutting tool can be adjusted relatively thereto by turning the cutting tool on its vertical axis. Will the sides of the presser and cutter be parallel if that adjust-

ment is made, assuming the two to have been set parallel as to their sides, but found not to be parallel as to their edges?

A. The capacity of adjustment upon its vertical axis enables the chisel to be adjusted, so that its cutting edge bisects a vertical plane parallel with the vertical plane bisected by the edge of the presser foot. If such parallelism exists it will be destroyed, of course, by turning the chisel stock upon its axis. If it be desired to alter the elevation of one or the other end of the cutting edge of the chisel, that alteration is in practice effected by loosening the set-screw, which holds the chisel in its stock, and dropping down the side of the chisel which requires to be dropped, and then putting in a gib or wedge between the top of the chisel and the upper end of the seat in the stock, or such alteration may be effected by driving in the wedge which has been previously inserted, the set-screw, of course, being loosened, if necessary to permit such adjustment of the chisel, and tightened again after the adjustment is effected.

Redirect examination by CHAUNCEY SMITH, Esq.:

Q. 25. In the defendant's machine is it necessary or desirable that the edge of the cutting tool shall be parallel to the surface of the blank along the line of the cut, notwithstanding the fact that the obliquity of the cut across the blank is obtained by
63 turning the tool on a vertical axis instead of the bed upon which the blank is fastened?

A. It is not only desirable, but it is necessary for a successful operation of the machine in the production of cuts of like depth at both ends.

Q. 26. Is that parallelism secured by the bar or presser foot that you have spoken of as corresponding to the guide U, described in the Bernot patent?

A. It is.

Recross-examination by B. F. THURSTON, Esq.:

Q. 27. Suppose the defendant's machine, instead of being constructed with any means for adjusting the cutter relatively to the presser, were so constructed as to be incapable of any such adjustment, but that the operator obtained the parallelism between the edge of the chisel and the bearing face of the presser by grinding the chisel, more or less, to make its edge exactly parallel with the presser, would such machine, in your judgment, be an infringement of the third claim of the Bernot patent?

A. It would be wholly impracticable, in my judgment, to obtain the necessary parallelism between the cutting edge of the chisel and the edge of the presser foot, or, more accurately speaking, the surface of the blank immediately under the cutting edge of the chisel, by removing, grinding, and reinserting the chisel in its stock, as suggested in the question. If the machine should be so constructed as to make it impossible to obtain the necessary parallelism of the parts in question other than by grinding the chisel, I

think the structure would not contain the invention of the Bernot patent, because in practice it would not do what the Bernot patent can do.

Q. 28. You regard some means of relative adjustability of the parts in question essential to enable the Bernot invention,
64 specified in the third clause, to be embodied therein to be practiced?

A. I do.

EDW. E. QUIMBY.

Subscribed and sworn to before me this 30th day of October, A. D. 1882.

A. J. CUSHING,
Notary Public.

Complainant produces and offers in evidence a certified model from the Patent Office of the machine described in the drawings and specifications of letters patent to Etienne Bernot, No. 29236, and the same is marked "Complainant's Exhibit Bernot Model."

Also letters patent of the United States numbered 29236, dated July 24th, 1860, to Etienne Bernot, of Paris, France, for an improved machine for cutting files, and the same is marked "Complainant's Exhibit A."

Also the assignment of said letters patent to George Somerville Norris, dated October 8th, 1860, and the same is marked "Complainant's Exhibit B."

Also certificate of extension of said letters patent 29236, granted by Mortimer D. Leggett to Charles A. Nichols, administrator of Etienne Bernot, dated July 23d, 1874, and the same is marked "Complainant's Exhibit D."

Also release of Flore Louise Vannier and others, heirs of Etienne Bernot, to Charles A. Nichols and his assigns, dated November 12th, 1874, and the same is marked "Complainant's Exhibit E."

65 Also assignment of said extended letters patent by Charles A. Nichols, administrator of Etienne Bernot, to the New American File Company, dated December 1st, 1876, and the same is marked "Complainant's Exhibit F."

Also confirmation of former assignment made by said Etienne Bernot to said George Somerville Norris, dated August 9th, 1862, and the same is marked "Complainant's Exhibit C."

(The foregoing exhibits are printed with the complainant's bill.)

Also copy of letters of administration upon the estate of Etienne Bernot, granted to Charles A. Nichols May 12th, 1874, and the same are marked "Complainant's Exhibit G."

It is also stipulated and agreed for the purposes of this case that said Etienne Bernot died at Paris, France, on the 25th day of September, A. D. 1863, leaving as his heirs—

Flore Louise Vannier, his widow; Etienne Marie Bernot, his son; Charles Eugene Bernot, his son; Louis Georges Durochel, his grandson.

Attest:

A. J. CUSHING,
Notary Public.

66 EXHIBIT G.

Letter of Administration.

THE STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS, } *sc:*
Providence, }

[SEAL.] By the municipal court of the city of Providence, in the county of Providence and State aforesaid, exercising probate jurisdiction, to Charles A. Nichols, of the city, county, and State aforesaid, Greeting:

You, having been appointed by this court administrator on the real and personal estate of Etienne Bernot, late of Paris, in the Republic of France, deceased, intestate, and having given bond as the law directs, are hereby authorized and empowered to receive, recover, and take possession of the estate which to the said Etienne Bernot at the time of his death did appertain and belong, and the same fully to administer according to law.

Witness Amasa S. Westcott, Esquire, judge of the municipal court of the city of Providence, this 12th day of May, in the year of our Lord one thousand eight hundred and seventy-four.

GEO. B. NICHOLS, *Clerk.*

Recorded in Book of Letters of Administration No. 8, page 87.

CHARLES C. MUMFORD, *Clerk.*

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS:

Clerk's office of the municipal court of the city of Providence, in the county of Providence, in said State, exercising probate jurisdiction.

I, Charles C. Mumford, clerk of said court, do hereby certify that the annexed copy is true copy of the letter of administration
67 granted to Charles A. Nichols, as administrator on the estate of Etienne Bernot, late of Paris, in the Republic of France, which letter is duly recorded in the records of this court in Book of Letters of Administration No. 8, page 87.

[SEAL.] In attestation whereof I have hereunto set my hand and have affixed the seal of said court this 31st day of March, A. D. 1885.

CHARLES C. MUMFORD, *Clerk.*

68 *Evidence for Defendant.*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Wilmarth H. Thurston, special examiner.

PROVIDENCE, *December* 8, 1882.

Present: Wm. W. Douglas, Esq., of counsel for complainant, and Benjamin F. Thurston, Esq., of counsel for defendant.

Deposition of Henry B. Renwick.

Direct examination by BENJ. F. THURSTON, Esq.:

Q. 1. What is your name, age, residence, and profession?

A. Henry B. Renwick; 65 years of age; reside in the city of New York, and am by profession a civil and mechanical engineer.

Q. 2. Please state what have been your opportunities for familiarizing yourself with matters and questions relating to subjects of mechanical inventions, and what has been your experience in testifying in suits relating to questions of infringement of letters patent in the circuit courts of the United States, and particularly state what is your familiarity with machinery for cutting files and letters patent relating to such subject.

69 A. I have for the last thirty-five years been occupied in questions relating to mechanical inventions, and have during the last twenty-eight or thirty years been frequently examined during each year as expert in suits in which patents were in question. I commenced familiarizing myself with file machinery some thirty-five years ago, while chief examiner in the Patent Office, the subject of patents for file-cutting machinery being under my charge. Since then I have examined many file-cutting machines in operation, remembering especially at present an examination of all the machines of the Whipple File Co., near Boston, some fourteen years ago, and since then examinations of the machinery of the defendant company.

Q. 3. Have you examined a copy of the letters patent granted to Etienne Bernot in suit in this case, dated July 24, 1860, No. 29236? And, if you have, state what improvement in file-cutting machinery is described therein and specified particularly in the third clause or claim thereof.

A. I have frequently examined a certified copy of the patent referred to in the question, using a magnifying glass with the drawings, and endeavoring to find out exactly how the machine was constructed.

The patent as a whole describes a machine provided with a chisel, called a "graver" in the patent, which has a vertical motion in ways as usual and is actuated by a revolving cam to lift it and a spring to throw it down. The machine has, second, a rolling bed upon which the file to be cut is supported, and this rolling bed is mounted on a carriage and provided with a feed motion, the whole construction being such that the file can be fed underneath the chisel, both at various angles with the horizon and at various angles with reference to a vertical plane, thus enabling the machine to cut teeth by blows either perpendicular or inclined to the file blank and at varying angles across the file, measuring from edge to edge thereof, the file being free to roll sidewise with the bed, under

70 the control of a presser or presser-foot, which is borne down by a weight upon the surface of the file and a short distance in

front of the chisel. So far the description of the machine is clear enough.

The patent also describes this presser as adjustable—that is, so mounted in the machine that its acting surface may be set at various angles with the horizon, whereby the edge or acting surface of the guide or presser may be kept parallel with the edge of the chisel and the file kept parallel with the "graver" or chisel by which the cutting is performed. In the machine it is easy to see that the faces of the guide and chisel are set parallel to each other, and that the guide is a long rod having the guide or presser proper at its lower end, and also that in the normal condition of the parts both the chisel and the presser move in vertical planes. It is also evident that if the chisel edge be not ground horizontally, but is at an angle to the horizon, then the guide as a whole must be turned upon a horizontal axis, so that its acting surface shall be parallel to the edge of the chisel. I was unable to ascertain from the patent and drawing precisely how the mechanism for supporting the presser so that it was free to move up and down under the influence of the weight, and also for setting the presser stock, and consequently the acting surface of the presser at an angle with the horizon, is constructed. I could get the general idea that the presser stock moved in ways, although such ways are not described in the patent, which ways were somehow or other so mounted that they could be swung to various angles with a vertical line and clamped in any desired position, thus permitting the acting surface or edge of the presser to be set parallel with the edge of the chisel.

Subsequently to these examinations of the Bernot patent I saw a model of it at the office of Mr. Douglas, and then was for the first time enabled to discover exactly how the presser stock was mounted, adjusted, and held in adjustment, while at the same time it was free to move up and down, being lifted by the surface of the file passing under it and held down by the weight. This
71 model differs in some respects from the drawings, which, as far as I can discover, represent a structure which would prevent the presser from moving up and down, in which case it would be useless.

Now, the mechanism described in the patent, so far as I could understand it, and the mechanism shown in the model are such as to permit the guide or presser to be, in the words of the claim, "set parallel" to the graver or chisel, and I understand the third claim to refer to the contrivances described in the patent and represented in the drawings, by means of which the guide can be set or adjusted and held parallel to the graver, of course including the equivalents of those contrivances, and I do not think that the claim refers to a presser not capable of being set and to a chisel capable of being set, because the mechanism obscurely described in the patent and plainly shown in the Bernot model could not by any possibility be applied to the stock of the chisel or to the chisel itself and the machine remain an operative machine.

There is no reference in the third claim to the rolling bed or to any parts of the machine except the guide or presser, the graver

or chisel, and the contrivances by which the presser may be set parallel to the graver. The claim, in fact, as I said in substance before, refers to certain mechanical means by the aid of which the acting surface of the presser can be set parallel to the edge of the graver. It is evident that the claim does not refer to mechanism by means of which the tool or presser can be twisted on their vertical or nearly vertical axis, because the faces or sides of the chisel and presser are set parallel to each other in the machine and so fixed immovably, and if the machine were cutting a file in which the chisel, as it usually does, strikes at an angle to the surface of the file, then any twisting of either the graver or the presser on a vertical axis, so that their faces were not parallel, would destroy the parallelism of the acting surface of the presser with the edge of the chisel.

72 Q. 4. State whether, in your opinion, the devices employed in the Bernot machine for making the presser adjustable with respect to the chisel or cutter, so that their acting surfaces may be brought into parallelism, could be applied to the chisel of the Bernot machine, and the machine practically operate as a file-cutting machine, and give the reasons for the opinion you may express.

A. I have already said that it could not practically. Inspection of the Bernot machine will show that the chisel stock is lifted by a rotary cam which passes through a slot in the chisel stock and strikes against a cross-bar or a cross-surface in the chisel stock in order to lift the chisel stock and chisel, and also that the chisel stock is thrown down by a spring. Now, if the chisel stock were mounted in ways which could be turned sidewise on a horizontal axis it would be necessary to mount the heavy frame work on a horizontal axis, and the machine would probably be so rickety that it could not be worked, and the pulley for the driving belt would be constantly getting out of proper relation with the pulley which drives it. If it were attempted to obviate this difficulty by leaving the framing of the machine as it is, stationary, and making the ways for the chisel stock adjustable (putting in separate ways for that purpose), then the face against which the cam acts would get out of proper relation with the cam and the chisel stock out of proper relation with the spring which forces it down, and, as I understand it, this adjustment sideways must be a very considerable one. I will explain on this head. In cutting ordinary files with the teeth running at an angle of, say, 35 or 45 degrees with the edge of the file, the usual practice, and, so far as I know, the only proper practice, is to incline the edge of the chisel to the horizon, either by a proper grinding of the chisel or by clamping or screwing it in its stock so that its edge is inclined to the horizon. The edge of the chisel is thus not at right angles to the axis of the stock, but inclined thereto, and too great tipping of the rolling bed is prevented. Now, there is no description in the Bernot patent of the

73 acting surface of the presser or the parts connected with that surface being removable from its stock, and the drawings represent the acting surface of the presser as perpendicular to the axis of its stock. It would be therefore necessary to turn the

ways of the presser-foot stock upon a horizontal axis until the acting surface of the presser was parallel with the inclined edge of the chisel, and this would involve considerable turning of the ways, and the mounting of the chisel in ways which turn upon a horizontal axis would be therefore practically impossible, There is not one word said in the patent about this adjustment of the presser being useful to compensate for imperfect grinding of the tool, and, as far as I can discover from the construction of the machine as a whole, the main use of the adjustability on its horizontal axis of the presser is to enable the operator to set its acting surface parallel with the edge of a tool which is purposely ground or set in its stock with its edge inclined to the horizon.

Q. Mr. Quimby, the complainant's expert witness, in giving his understanding of the third claim of the Bernot patent and defining what structures would come within said claim, as he understands it, says in substance that if a file machine were so constructed that the necessary parallelism between the acting faces of the presser and the cutting chisel—the presser being incapable of adjustment—were obtained by grinding the chisel, so as to bring its edge to parallelism with the edge or acting surface of the presser, it would not contain the Bernot invention. State whether you agree with or disagree from him upon that matter.

A. I agree with him exactly so far.

Q. 6. Mr. Quimby, in his answer to the third interrogatory, states in substance that he understands the mechanism which forms the subject of the third claim of the Bernot patent to be a guide or presser which is adjustable relatively to the cutting tool or "graver." Do you agree or disagree with him in this opinion?

A. I agree with him, supposing that he means adjustable relatively to the graver by the means described in the patent or their equivalents.

74 Q. 7. Have you examined the file-cutting machines used by the Nicholson File Company, charged in the opening testimony in this case on the part of the complainant to infringe the third claim of the said Bernot patent? And, if yea, state whether such machines, in your opinion, do or do not contain the combination covered by the third claim of the said Bernot patent, and give fully the reasons for the opinion which you may express, after considering particularly the fact that the presser in the Nicholson machine is non-adjustable relatively to the cutter, and after considering all the capacities for change of position which the cutter may possess as the machine is organized and used.

A. I have examined the machines used by the Nicholson File Company for cutting teeth on the faces of files, and also the edging machines. The machines used for cutting the teeth are all of the same general character, and are all like to each other in those parts which are charged to infringe the third claim of the Bernot patent, and I produce a model, on which I have marked my initials, which is in correspondence with those machines, so far as those parts which are involved in this controversy are concerned.

(Model referred to is put in evidence by the defendant, and is marked "Defendant's Exhibit Model Nicholson File Machine, W. H. T., spec. ex.")

In order to answer the remainder of the question it will be necessary first to describe the construction of the machine generally, and also to produce some exhibits showing the construction of parts of the machine, and a structure in the nature of a diagram to explain my meaning.

The model shows a gate, on which I have marked the letter A, which slides in suitable guide ways B B, and having projecting from it a bracket, C. In the machine a rotary cam strikes against this bracket and lifts the gate. While lifting, it twist*ing* a torsion spring, which, as soon as the cam passes by the bracket, throws
75 the gate down and holds it down until a cam again strikes the under surface of the bracket and lifts it. The tool or chisel holder is shown in the model, as it is in the machine, as attached to the gate by passing through a vertical hole in the bottom of the gate, being secured therein by a nut screwed on the upper end of the tool-holder. This tool-holder has a cavity or slot in its lower side, and the tool or chisel is placed in this slot with the upper surface of the tool resting against the bottom of the slot (which is the highest part of the slot, the opening of the slot being at the lower end thereof). In this slot the tool is secured by a set-screw. I produce a tool-holder or a tool stock such as is used by the defendant company with a tool in it.

(Exhibit referred to is put in evidence by defendant and marked "Defendant's Exhibit Nicholson Tool Stock and Cutter, W. H. T., spec. ex.")

It will be observed that in this tool stock there is no slot planed into the tool-holder, but that the slot is formed by the two jaws of what may be called a vise, the set-screw operating not to press against the tool but to clamp the tool between the fast and movable jaws of the vise. The difference between the tool-holder in the model and that which I have just produced is not substantial, and I wish it to be observed that both of them have a bottom to the slot against which the top of the tool rests. When the tool is screwed in the slot of the tool-holder and the tool-holder is secured in place by its nut, both tool and tool-holder can be twisted on a vertical axis by taps with a hammer in a horizontal direction against the head of the set-screw.

Now, turning back to the model, it represents a carriage, on which I have marked the letter D, which is free to slide in suitable ways. In the actual machine this carriage is, by means of proper mechanism, fed under the chisel by an ordinary step-by-step motion, which feeds the bed the distance between two adjoining teeth of
76 the file at each step and during the time at which the chisel is not in contact with the file, and it will be noticed that the ways in which this carriage slides are not adjustable, either horizontally or vertically, but always remain in the same fixed position

with respect to the gate in which the tool moves, both as to horizontality and to line of direction of travel, differing in this respect entirely from the Bernot machine.

On this carriage, and in a semi-cylindrical cavity therein, is placed a rolling bed, on which I have marked the letter E. This bed has a semi-cylindrical bottom which fits in the semi-cylindrical cavity in the carriage, and on the upper part of this bed the file blank which is to be cut is secured, and in consequence of this construction the file can roll sidewise in the manner set forth in the old Crum patent, No. 8199, dated July 1st, 1851, Crum being, as I understand, the inventor of the rolling bed, which was movable under the cutter, as the rolling bed in this machine is.

Turning back, now, to the model, it will be noticed that there is a presser bearing on the file blank, in front of the cutter or chisel. This presser consists of a presser proper, one of which I produce, and a stock.

(Presser referred to put in evidence by defendant and marked " Defendant's Exhibit, Nicholson Presser, W. H. T., spec. ex.")

I have marked with a file a cross on the acting surface of the presser proper, " Defendant's Exhibit Nicholson Presser."

The stock of the presser on the side thereof furthest from the chisel is formed into a rack, and the presser slides in ways in a casting which exists in the model. Neither this presser nor its ways are capable of tipping on a horizontal axis or of twisting on a vertical or nearly vertical one. Its only motions are up and down in the same plane.

In the model in front of the presser rack there is mounted a small cog wheel whose teeth engage with the rack. This cog wheel
77 is secured upon its shaft by a set-screw, and on another part of the shaft is mounted a wooden handle, and in the actual machine the end of the part represented by this handle is always pulled downwards by a weight, and it will be seen by inspection of the model that a weight pulling down upon the end of this handle forces the presser down upon the blank.

The machine also contains mechanism for stopping its operation when all the teeth have been cut and a contrivance by which the operator can increase or decrease the force of the torsion spring which throws down the hammer, and perhaps some other contrivances which I do not specially remember, but none of which have any bearing upon the present controversy.

Before going further into the construction of the defendant's file-cutting machine I wish to premise that I have seen the machine for grinding the chisel or tool used by the defendant, and that it consists, in fact, of a grindstone and a carriage for holding and moving the cutter or chisel which is to be ground. This carriage as a whole is composed of two members and is much like the slide rest of an ordinary lathe, and is, like it, mounted on ways or shears, upon which the carriage as a whole is moved to and fro by proper machinery, the motion being across the face of the grindstone. On top of the lower member or carriage is a pair of ways, which are at

right angles to the ways on which the lower carriage moves, and on these ways in the lower carriage is mounted the second member or carriage, which can be moved toward and drawn away from the face of the grindstone, as is the case with an ordinary slide lathe rest. The tool to be ground is clamped on this upper carriage, and the angle at which its edge shall be ground is determined by the angle at which it is clamped in the slide rest. When the tool is clamped in the upper carriage that carriage is run back so that the edge of the tool will not touch the grindstone, and the lower carriage is set in traversing motion, it being understood that this traversing motion is in lines parallel to the axis of the grindstone, and that
78 the back of the chisel is also clamped in a line parallel to the axis of the grindstone. When the carriage commences to traverse, the operator by turning a hand wheel forces the upper carriage and consequently the edge of the tool towards the face of the grindstone, so that an edge is gradually ground upon it while it is being traversed across the face of the grindstone. When the edge is completed the tool is taken out of the clamp after the traversing motion has been stopped.

As the tool is traversed over the whole face of the grindstone in lines parallel with the axis thereof it follows that the face of the stone is kept square and true, and, as the back of the tool is kept parallel with the same axis, it follows that the edge of the tool and the back thereof are parallel to each other, and that the tool is of equal depth from end to end, such parallelism and equality of depth being as accurate as machinery will produce.

After the tools or chisels have been thus ground the edges are smoothed and perfected by applying them upon a lap, which is a soft metal wheel charged with very fine emery. The edge of the tool which I produced shows on its edge the effect produced by the lap.

I now produce a structure in the nature of a diagram consisting of a piece of wood with metal strips secured in it, on which I have written my initials.

(Exhibit is put in evidence by defendant and marked "Defendant's Exhibit Renwick Illustrative Model, W. H. T., spec. ex.")

The face *a* of this model represents the path in which the file is supposed to travel, and this path, as I have before stated, is fixed, invariable, and non-adjustable in the defendant's machines. Now, supposing that it is desired to construct a machine capable of cutting a file with a tooth which is at an angle of 45 degrees with the axis of the file or the line of travel of the file, such as would
79 be cut by a cutter occupying the position represented as *f* on the illustrative model, the first thing is to determine how much the edge of the cutter shall incline to a horizontal plane when the face of the cutter is set at the proper angle to the line of travel of the file. Now, by noticing the model it will be seen that the line *d e* is longer than the line *b c*, on the opposite face of the model, and consequently that the edge of the cutter at *c* must be lower than it is at *d* by the difference between *b c* and *d e*. This relationship

of the edge of the cutter to a horizontal plane having been obtained, the next thing is to plane or form the bottom of the slot in the tool-holder so that the bottom of that slot bears the same relation to a horizontal plane that the edge of the cutter bears to it; consequently, when a cutter whose edge and back are parallel is clamped in the tool-holder with its back against the bottom of the slot, the edge of the cutter is in the best possible position to cut the file properly, provided the edge of the cutter is inclined by twisting the tool-holder so that its edge will occupy the predetermined position to cut the tooth at the predetermined angle with the line of travel of the file. Therefore, after the bottom of the slot has been properly sloped and the tool put in the tool-holder, the tool-holder is tapped around by striking against the head of the set-screw as I have before described, until, by means of a gauge, which I now produce, it is determined that the edge of the tool is at the proper angle with the path of the file.

(Gauge is put in evidence by the defendant and marked "Defendant's Exhibit Nicholson Gauge for Determining the Angle of the Chisel with Reference to the Path of the File to be Cut, W. H. T., spec. ex.")

The tool now is resting upon a file blank underneath it, and the angle of the face of the presser to the horizon and to the line of the travel of the blank is determined by a similar calculation or
80 laying down, as it is termed, upon a drawing board. The presser is then put into its stock, and, if its acting surface should not fit properly upon the face of the file, then the angle of its acting surface is changed by regrinding the acting surface or the top of the presser foot where it fits on its stock, or both, on the try-and-fit principle, until the bearing of the acting surface of the presser foot is sufficiently accurate. The calculation which I have spoken of and the grinding and fitting of the parts are not adjustments of the machine, but are operations in designing and making it or completing its structure.

After a tool has cut a certain number of files it becomes dull and must be removed and replaced by a new one. If the grinding machine does its work properly and the action of the lap has not affected the parallelism of the edge of the tool or cutter with its back, then the new cutter, when put in, will go on and work as accurately as the old one, provided the presser has not so worn that it will hold the file at the wrong angle in the rocking bed. When a new cutter is put in the operator lets it down upon the file which is held down by the presser, and looking under the cutter can determine whether its edge conforms with practical accuracy to the surface of the file, and if he sees that it does not do so he twists the cutter slightly by tapping the set-screw in the stock until the required conformity is obtained, this tapping of the cutter causing it to rotate on a vertical axis, and he can only so rotate the cutter through a very small angle, because in so doing he first destroys the parallelism between the acting surface of the presser foot and the edge of the cutter, and, second, alters the angle of the cutter, and consequently of the tooth,

relatively to the axis of the file, so that the tooth can no longer be cut exactly at the required angle; third, when the cutter is thus tapped out of its predetermined or proper angular position and out of parallelism with the acting surface of the presser the cutter must,

81 in cutting files which are bellied or of curved contour on their faces, make a cut somewhat deeper on one edge of the file than on the other edge, the greater depth of cut shifting from one edge of the file to the other edge in some, if not most, forms of bellied files.

This adjustment by tapping enables the cutter to make the cut more even from edge to edge than before it was tapped, but does not cause it to make a cut of even depth from edge to edge, but, on the contrary, forces it to make a cut of uneven depth, and to a certain extent—to the extent of the rotation of the cutter on its vertical axis—interferes with the predetermined angle of the teeth, causing them to be cut at a different angle, and it does so because the parallelism between the edge of the cutter and the acting surface of the presser is destroyed by rotating the cutter on a vertical axis.

Adjourned to Saturday, December 9, 1882, at 10 o'clock a. m.

PROVIDENCE, *December* 9, 1882.

To return to the question of the manner of using the defendant's machine, I will state that if the workman discovers that in order to make the tool edge coincide with that portion of the file upon which it is to rest it is necessary to twist the tool-holder so far that it would so change the angle of the teeth to the sides of the file that the file would be either, to the eye, out of its proper form or that the teeth would be at such an angle as to unsuit the file for the purpose for which it is designed, he may then think that it is the presser which is in fault. In that case he calipers the chisel, and if he finds it correct sets it at a proper angle by means of his gauge, and then leaves it resting on the file, and afterwards, having raised the presser and guide so that the rolling of the bed and file is controlled by the chisel alone, lets the presser down again gently, and if it fails to fit then becomes satisfied that the presser is so worn as to be unfit for use. The presser is then taken out of the machine and the acting

82 surface is sometimes reground and sometimes a new presser foot is substituted for the old one, the presser being fitted by grinding as when the machine is first put at work.

I will now endeavor to explain how this rotation of the cutter affects the position of its edge with regard to the file, and to prove that it does not set the guide parallel to the "graver" or the "graver" parallel to the guide, but, on the contrary, destroys that parallelism.

On the "Defendant's Exhibit Renwick Illustrative Model" I have drawn a broad line marked *g*, and when the cutter and guide are properly ground and set and the former twisted until it is shown by the gauge that the tool is at the proper angle with the path of the file, then the broad line *g* would represent the bearing of the acting surface of the presser, and the piece of metal which I

have marked *h* would represent the chisel, and it will be observed that the line of the bearing surface is parallel with the line of the cut, and therefore parallel with the edge of the chisel. By laying two pieces of wire, one on the surface *g* and the other behind the chisel *h*, it will be seen that those two wires are parallel to each other, and that they both slope down at the same angle with the horizon, and that they both point to the same point of the compass. Now, supposing that it is found that a new chisel when let down upon the file does not touch it from edge to edge accurately, then it must be turned, we will say, into the position represented by the piece of metal *k* (although in practice it is never turned so far). If the wires be now again applied, one to *g* and one behind *k*, it will be seen that the two wires slope to the horizon at different angles and point to different points of the compass, so that the edge of the chisel *k* is out of parallelism with the acting surface *g*, both in horizontal plane and in vertical plane.

Now, although by this adjustment of twisting the tool the tool edge and the presser surface are put in such a position that they are then, although out of parallel, still in the same plane—that is, the plane *a a* of the illustrative model—yet a consideration of the
83 machine with a bellied file clamped on the rolling bed will show that, as the file progresses under the teeth, the presser will no longer hold that portion of the surface of the file which is to be cut by any one blow of the chisel parallel with the edge of the chisel, and that therefore the cuts must be, it is true, in a very slight degree greater in depth at one edge of the file than the other.

Turning now to the question whether the defendant's machine embodies the invention set forth in the third claim of the Bernot patent, I state my opinion that it does not, first, because the adjustment is applied in the defendant's machine to the cutter, whereas in the Bernot it is applied to the presser; secondly, because the twisting of the cutter on a vertical axis produces a different result from twisting the cutter on a horizontal axis, as it would be if Bernot's invention were applied to the cutter, this difference of result being that when twisted on a vertical axis the cutter, in the first place, cuts out the true predetermined angle for the file teeth, and must cut at different depths on the two edges of the file, whereas by Bernot's method of adjustment on a horizontal axis, if applied to the cutter, the teeth would always after the adjustment be cut at the predetermined angle and of equal depth on both edges and across the file.

With Bernot's means of adjustment, even applied to the cutter, the adjustment is possible and practical, and will produce its effect when the file blank, as is sometimes the case, and as is shown in the drawings of the Bernot patent, lies and travels in a horizontal plane, the cutter moving in a vertical plane; but when the blanks are in such relative position no adjustment could be made by twisting the cutter upon a vertical axis, because the edge of the cutter, which was too far away from the file, could not be brought nearer to the file by any amount of turning on a vertical axis, so

long as the line of travel of the blank and the rise and fall of the cutter were as I have before stated.

84 The mechanism, therefore, by which the cutter is adjusted in the defendant's machine is different from that by which it is adjusted in the plaintiff's or Bernot machine. In Bernot the adjustment, which enables practically a perfect file to be cut, brings the edge of the chisel or cutter parallel with the acting surface or edge of the presser, considered both with reference to horizontal and vertical planes—that is to say, that when adjusted the edge of Bernot's cutter and the acting surface of his presser slope at the same angle to the horizon and point to the same point of the compass or are parallel in horizontal planes.

In the defendant's machine, on the contrary, the adjustment, which enables practically a perfect file to be cut, is not to put the edge of the cutter and the pressing surface in this relation of parallelism, but to throw them out of parallelism in one direction—that is, in the lines of the angle of the teeth—and to leave them out of parallelism in two directions, both with reference to horizontal and vertical planes.

Bernot adjusts by bringing the surfaces into parallelism and fixing them there. The defendant adjusts by taking the surfaces out of parallelism and fixing them in such relative non-parallel position, and I have before stated that Bernot's adjustment enables the machine to produce teeth of even depth and always at a proper angle, while the defendant's adjustment necessarily forces the machine to cut the teeth out of the proper predetermined angle, and of uneven depth in all files except those whose sides are plane surfaces.

I may observe in conclusion that the practical use of a rolling bed and a presser is for cutting files whose sides are not plane surfaces, but curved or bellied from heel to point, and if files with plane surfaces were manufactured the rolling bed and presser would be of little or no importance.

Q. 8. I have understood you in your previous answer to state in substance that if in the defendant's Nicholson machine the

85 edge of the chisel is ground so that it will stand at the proper angle for doing its work when it is mounted in its stock constructed as you have described, it will then be in parallelism with the properly formed presser in the machine in which such cutter is to go, and that in such case the invention recited in the third claim of the Bernot patent is not employed at all. Am I correct in my understanding of your statement in that respect?

A. I do not remember having stated what you have said, probably having failed to do so, if I have failed, because the proposition stated in the question is self-evident, there being in the case stated in the question no adjustment of any kind in working the machine.

Q. 9. I have further understood you in substance to say in your answer to interrogatory 7 that if the edge of the chisel happens to have been ground in the grinder or lapper so that it will not properly correspond with the presser in the machine in which it is to be put, that in such case the chisel can be turned on its vertical axis

so as to bear in a diagonal line upon the surface of the file blank, but that in such case the adjustment will be made with reference to the surface of the blank and not with reference to the presser, and such operation would not be practicing the invention contained in the Bernot patent and recited in the third claim thereof, for the reason that the cutter and the presser are out of parallelism both as to their sides and as to their acting faces, when they are thus adjusted in the defendant's machine. Am I correct?

A. You are.

Q. 10. Are you able to state within what limits of variation of the edge of the chisel when set in its stock from correspondence with the presser this axial adjustment of the cutter to the surface of the blank, in operating the defendant's machine, is possible, and produce salable work, or practically well-cut files?

A. No; I am not, for I am not a judge of files nor a salesman. In my opinion the variation would of necessity be a slight one.

86 If it requires more than a slight twisting to make the adjustment, then the chisel must be thrown aside to be reground and another one taken.

Q. 11. Do you find in the defendant's machines any means, in case a chisel has been ground out of proper correspondence with the presser, of "dropping down the side of the chisel which requires to be dropped," as suggested by Mr. Quimby in his answer to the 24th cross-interrogatory?

A. Yes; one side of the chisel can be dropped down and the clamp set-screw then set up so as to clamp it, but in that case the back of the chisel would not bear against the bottom of the slot and a few blows of the machine would knock the chisel out of its dropped-down position until its back bore fairly against the bottom of the slot.

Q. 12. Mr. Quimby further suggests that after the chisel has been dropped down as to one of its corners a wedge is, or can be, inserted into the open space which would thus result between the bottom of the slot and the back of the chisel. State whether such contrivance, in your opinion, would be a practical method of adjustment of the chisel in a file machine.

A. No; because under the very rapid and heavy blows of the machine the wedge would first become loose and then fly out. In questioning the foreman or superintendent of the cutting-room closely as to the mode of working the Nicholson machine, he told me incidentally that some two years ago, I think, their grinding machine got out of order and did imperfect work, and that, as they did not want to stop the cutting machines, they endeavored to adjust the chisels by driving a wedge in between the bottom of the slot and the back of the chisel at one corner of the back, and that the experiment failed, the wedge becoming loose and flying out. I never saw the experiment tried myself.

87 (Defendant's counsel puts in evidence a certified copy of the letters patent granted to John Crum, dated July 1, 1851, No. 8199, and the same is marked "Defendant's Exhibit John Crum Patent, W. H. T., spec. ex."

Also a certified copy of letters patent granted to Charles Miller and Thompson W. Decker, assignors to Thompson W. Decker, dated April 12, 1859, No. 23645, and the same is marked "Defendant's Exhibit Miller & Decker Patent, W. H. T., spec. ex."

Also an illustrative model of the machine described in said Miller and Decker patent, and the same is marked "Defendant's Exhibit Miller and Decker Model, W. H. T., spec. ex."

Also a certified copy of letters patent granted to Milton D. Whipple, assignor to the Whipple File Company, dated February 1, 1859, No. 22842, and the same is marked "Defendant's Exhibit Milton D. Whipple Patent, W. H. T., spec. ex."

Also an illustrative model of the machine described in said Whipple patent, and the same is marked "Defendant's Exhibit Whipple Model, W. H. T., spec. ex."

Also a copy of the English letters patent to Robert Craib Ross, dated March 4, 1853, and numbered 545 for that year, and the same is marked "Defendant's Exhibit Ross English Patent, W. H. T., spec. ex.")

(It is stipulated and agreed by counsel for the respective parties that the application of Etienne Bernot for the letters patent of the United States in suit in this case was filed in the Patent Office July 3, 1860.

And it is further stipulated and agreed between counsel that the same invention described in said letters patent of the United States was previously patented in France, August 31, 1854, and also that the same invention was previously patented in Great Britain, October 16, 1854, and also that the same invention was previously patented in Belgium, May 2, 1856, all of said letters patent being to said Etienne Bernot.)

88 Q. 13. I have heretofore asked you as to whether you agree with Mr. Quimby, the complainant's expert, in his statement concerning the necessity of some means existing in a file machine for making the presser adjustable to the cutter, in order for such machine to contain the invention recited in the third claim of the Bernot patent. I wish now to inquire whether the opinion that you have expressed upon the same matter was formed with any knowledge of Mr. Quimby's opinion or has been adopted by you after reading his deposition.

A. My opinion as to the scope of the third claim of the Bernot patent was formed after studying the patent and communicated to Mr. Thurston in June or July last, before Mr. Quimby's testimony was taken, and before I even knew that he was employed in the case, and before I had any conversation with him on the subject.

Q. 14. Please examine the letters patent granted to Miller & Decker, dated April 12, 1859, No. 23645, the same being "Defendant's Exhibit Miller & Decker Patent," and state whether you do or do not find therein contained the invention described in the said Bernot patent and recited in the third claim thereof, and give the reasons for the opinion you may express.

A. I have examined the patent frequently, and will refer in answering the question to the model put in evidence and marked

"Defendant's Exhibit Miller & Decker Model." This model is a fair illustration of the contrivance described in the patent, although it is wanting in the feeding mechanism, and although the chisel is not secured to the chisel stock by a clamp, as described in the patent. In this machine there is supported on the ways in which the chisel stock slides a presser, which is a hook-shaped piece of brass (the presser stock and presser being in one piece). The acting face of this presser is held down upon the file which is supported upon a rolling bed by two coiled brass springs, one on each side of the machine, these springs holding the presser down upon the file, because it is supported upon a nearly horizontal pivot which pro-
89 jects from the ways that guide the tool stock. (This pivot in the model is made of wood and has a brass pin stuck through it.) The presser is free to oscillate on this pivot, and is oscillated and held in position by a screw with a milled head, which is connected to the upper end of the presser stock, and passes through a nut fastened on the ways, the construction of the whole being such that turning the screw will vary the angle of the acting surface of the presser with the horizon, and that the presser is free to rise and fall, lifted by the file and pulled down by the springs, which are the equivalents of a weight for this purpose.

In this machine the presser has the same capacity of motion as in the Bernot machine, and can be set so that its acting face shall be parallel with the edge of the chisel. Consequently the machine can be adjusted for an imperfect chisel without changing the angular direction of the teeth and without any danger of cutting a tooth deeper at one edge of the file than the other, and therefore, as the adjustment of the presser is on a horizontal axis and the same effect is produced by its adjustment as is produced in the Bernot machine, it appears to me that this patent shows substantially the same invention as is described in the Bernot patent and referred to in the third claim thereof.

Q. 15. Please examine the letters patent granted to Milton D. Whipple, dated February 1, 1859, No. 22842, "Defendant's Exhibit Milton D. Whipple Patent, and also the illustrative model "Defendant's Exhibit Whipple Model," and state what combination of devices you find therein shown and described for compelling the surface of the file blank to be cut to occupy a plane determined by a straight-edge presser bar in the immediate vicinity of the cutter.

A. I find that the file has that face of it which is to be cut forced against a straight-edge presser bar at the time when a graver is cutting a tooth. The illustrative model, "Defendant's Exhibit Whipple Model," fairly represents the machine, so far as an answer to the question is involved, although the model is wanting
90 in many of the parts necessary in an actual machine. In this model the presser bar is a plate of brass with four screws passing through it, and the patent describes it as beveled on the side nearest the file blank (which is in the model made of brass), "so that its upper edge only is in contact with the face of the blank immediately below the point at which the cutting is made, thus holding the blank firmly in the immediate vicinity of the cut;" and

the patent states further: "I thus ensure uniformity of cut upon each face of the blank, notwithstanding any difference of thickness that may exist upon the opposite edges or any varying thickness of the blank from end to end."

Behind the blank in the model is shown a plate of soft metal, which is, in fact, a rolling bed, and this bed is forced towards the cutter, carrying the file with it against the presser bar by means of two wedges which act each against a block, the blocks lying between the rolling bed and the wedges, and being rounded on the sides which touch the wedges, so that this bed may be rolled or rocked under the operation of the wedges, so that the part of the surface of the file which is to have a tooth cut on it shall be parallel with the line of travel of the cutter, the parallelism being determined by forcing the file against the presser bar. In the operation of this machine after one tooth has been cut the wedges are lifted, thus relieving the pressure of the file upon the presser bar. The file is then fed forward the proper distance, the wedges then drop by their own weight, each forcing its block against the bed, and consequently forcing the face of the file against the presser bar. The cut is then made, and the machine goes on repeating this operation.

HENRY B. RENWICK.

Attest: WILMARTH H. THURSTON,
Special Examiner.

91 (Defendant's counsel puts in evidence an illustrative model of the machine described in the John Crum patent, No. 8199, and the same is marked "Defendant's Exhibit Crum Model, W. H. T., spec. ex.")

92 PROVIDENCE, *June* 12, 1883.

Present: William W. Douglas, Esq., of counsel for complainant, and Benjamin F. Thurston, Esq., of counsel for defendant.

Deposition of John Hough.

Direct examination by Mr. THURSTON:

Q. 1. What is your name, age, residence, and occupation?

A. John Hough; age, 66; residence, Malden, Mass.; occupation, a pattern-maker.

Q. 2. Please look at the letters patent now shown you, granted to Milton D. Whipple February 1, 1859, No. 22842, and state whether you recognize the file-cutting machine represented in the drawings as a machine with which you were once familiar.

A. I do.

Q. 3. State when you first had anything to do with the construction of a file-cutting machine, of which the drawings in the patent just shown you are an illustration.

A. As near as I can remember, it was in the spring of 1857, to the best of my knowledge. It was not any later than that, any way.

93 Q. 4. For whom were you employed, and what connection had you with the construction of any experimental machine?

A. I was employed by Mr. Milton D. Whipple and by Mr. Dodd and his son James. I made the patterns for an experimental machine.

Q. 5. When were any machines constructed for practical use, and how many before July 1, 1860?

A. I couldn't be definite about that. I can tell you definitely when I commenced making the patterns for them. I left my home in Malden and moved to Ballardvale September 23, 1858, and commenced work for the Whipple File Company at Ballardvale September 27, 1858. I should think there were a dozen or fifteen machines constructed for practical use before the first of July, 1860. I won't be positive. There may have been some more. The dates that I have above stated are taken from a diary which I kept.

Q. 6. Was there a single machine built in the first instance or more than one?

A. Well, I have the impression that the first one that was tried was tried to cut wood. There was more than one machine started, but one was finished first.

Q. 7. How many machines did it take to make a set?

A. Three—right-hand, left-hand, and edging machine.

Q. 8. Did you see any of these Whipple machines, such as are illustrated by the patent drawings, at work in the file shop, cutting files?

A. Yes, sir; a great number of them.

Q. 9. Can you swear positively that you saw a number of such machines at work cutting files prior to July 1, 1860?

A. Yes; I can.

Q. 10. How long did you continue to work at Ballardvale?

A. Until the company stopped work.

Q. 11. Did the company carry on extensively the business of making files prior to July 1, 1860?

94 A. Yes; they did; pretty extensively, though not as much as they did after.

Q. 12. Did they make both hand-cut and machine-cut files?

A. Yes, sir.

Cross-examination by Mr. DOUGLAS:

X Q. 13. Was the machine which you worked on the patterns for in the spring of 1857 an experimental machine or a perfected invention?

A. Both; it was perfected in one sense and not in other.

X Q. 14. Do you mean to say that the machine referred to in the last question and answer was the same perfected invention as described in the Whipple letters patent, dated February 1, 1859?

A. Well, it was in the main, but the machine was afterwards perfected by Mr. Southwick.

X Q. 15. Did you make the patterns for this machine while you were at Malden and before you moved to Ballardvale?

A. Yes, sir; I made the patterns for the experimental machine before I moved to Ballardvale, and then the thing was perfected by Mr. Southwick?

JOHN HOUGH.

Attest: WILMARTH H. THURSTON,

Special Examiner.

Deposition of Alpheus B. Southwick.

Direct examination by Mr. THURSTON:

Q. 1. What is your name, age, residence, and occupation?

A. Alpheus B. Southwick; age, 77; residence, Providence, R. I.; occupation, a machinist and mechanical engineer.

95 Q. 2. Had you at any time—and, if so, in what year—anything to do in the preparation of drawings for or the construction of a machine for cutting files such as is generally illustrated in the letters patent to Milton D. Whipple, dated February 1, 1859, No. 22842? And, if so, state the facts.

A. I commenced in 1858, in August, to make drawings of that machine.

Q. 3. At whose request?

A. At the request of Jonathan M. Dodd. There was no company formed at that time. Mr. Dodd was associated with Mr. Whipple.

Q. 4. After the formation of the company did you go to Ballardvale; and, if so, how long did you remain there?

A. I went to Ballardvale in September, 1858, and remained there until the spring of 1866, the latter part of March or the fore part of April, 1866.

Q. 5. How many machines for cutting files, embodying the general construction and mode of operation illustrated by the said Whipple patent, were in use at the Whipple File Company in cutting files prior to July 1, 1860, to the best of your knowledge and remembrance?

A. A number were in use. A set of three machines were built at first and the first steel blank was cut April 19, 1859. After that the machines were built and put in use as fast as we could get them out. Just how many machines were in operation by the first of July, 1860, I don't remember; as many as we could get built.

Q. 6. According to your best judgment, how many machines were built and put in operation between April 19, 1859, and July 1, 1860, a period of about a year and two months?

A. I cannot state, but I know that a number were built and put in use before July 1, 1860.

96 Cross-examined by Mr. DOUGLAS:

X Q. 7. When you refer to the general construction and mode of operation of the machines built and used by Whipple File Company

prior to July 1, 1860, do you mean that those machines were identical with the machine illustrated in the drawings of the Milton D. Whipple patent? If they differed from the machine illustrated in the patent, please state the points of difference.

A. They were mainly like the drawings of the patent; the main features were the same.

X Q. 8. Are the parts of the machine represented in the "Defendant's Exhibit Whipple Model," which serve the purpose of controlling the situation of the blank with reference to the cutter the same as the parts of the machines in use at the time spoken of by the Whipple File Company which served the same purpose?

A. Substantially the same. The only difference was that the machines as actually made had the rolling-bed blocks made in two pieces instead of in one block, as each of such pieces marked 10 in the drawings of the Whipple patent is shown to be; and these two with their convex faces toward each other were united at their central sections by a hinge joint, and such block was wide enough to be equal in width to the thickness of the two wedges instead of having two blocks side by side, as in the model. The reason was to avoid the wear between the straight face of the wedge and the convex surface. Under this arrangement there were two straight surfaces in contact—*i. e.*, the straight face of the wedges and the straight face of the block, the joint as before described being formed in the block.

Redirect examination by Mr. THURSTON:

Re-D. Q. 9. Since the previous portion of your deposition was taken have you visited the works of the Nicholson File Company, and were you shown a number of so-called old Whipple machines?

97 A. Yes.

Re-D. Q. 10. Did you recognize one of the machines so shown you as the first Whipple machine which you saw at Boston when you commenced making drawings?

A. Yes; for flat files.

Re-D. Q. 11. Is the part now shown you taken from said machine the original part of said machine which operated to hold the face of the file blank up to the straight edge bar so as to bring the face of the blank parallel with the path of movement of the cutter?

A. It is, so far as I can remember it.

Re-D. Q. 12. Referring now to the modification which you described in your cross-examination, state whether the hinged block which extended across both wedges had a straight face on the side which adjoined the faces of the wedges, and whether the faces of the wedges were made rounding or bevelled at the corners as shown in the two wedges now shown you.

A. That is one of the details that I don't remember distinctly about—about those beveled edges. They probably were beveled, but I don't have it distinctly in my mind.

Re-D. Q. 13. In constructing the machines after you became engaged in making drawings, what do you understand was the office to be performed by the wedges and the pivoted block and the bar against which the face of the file blank to be cut bore when in combination?

A. The office is to keep the surface of the blank firmly up to the bar or face-plate while being cut.

Re-D. Q. 14. Suppose the blank was thicker on one side than on the other slightly, how would the machine operate with such a blank?

A. There would be yield enough in the parts for the wedge on the thinnest side of the blank to drop so as to bring it up firmly.

98 Re-D. Q. 15. Do you mean to bring the face of the blank to be cut firmly up to the bar or face-plate, notwithstanding that one edge of the blank was a little thicker than the other?

A. That covers what I said before. All blanks vary a little in thickness.

(Defendant puts in evidence the parts referred to by the witness, and the same are marked "Exhibit from Original Whipple Machine" and "Exhibit Beveled Face Wedges" respectively.)

Cross-examination by Mr. DOUGLAS:

X Q. 16. Among the pieces of the original Whipple machine which have just been produced, do you find anything corresponding to the hinged block which you described as existing in the machine you saw in Boston?

A. Corresponding in action, but not in construction. Those two pins give a bearing for it to roll either way.

X Q. 17. Then if the pieces now produced are pieces of that identical Boston machine, were you or not mistaken in describing the block which in that machine was interposed between the wedges and the zinc behind the file blank as consisting of two pieces hinged or jointed together?

A. My description to which you refer did not relate to the Boston machine, but to the machines constructed afterwards according to my drawings.

X Q. 18. Please look at the block forming a part of "Exhibit Beveled Face Wedges," and say whether or not it answers your description of the hinged blocks which existed in the machines made according to your drawings as you have described.

A. That is not a hinged block. It is evidently one that somebody else used afterwards.

99 Redirect examination by Mr. THURSTON:

Re-D. Q. 19. Can you state whether the original Boston machine was actually put to work cutting files at Ballardvale or elsewhere?

A. Not at Ballardvale, but at Boston. It was merely an experimental machine.

Re-D. Q. 20. Do you know how long the machine was run in Boston?

A. I don't know how long it was run in Boston.

Re-D. Q. 21. Do you know whether in fact it was moved to Ballardvale subsequently?

A. I have no recollection of seeing it there. It is very evident that it was moved there, but I can't tell when.

Re-D. Q. 22. Was it in August, 1858, that you went to Boston?

A. Yes.

ALPHEUS B. SOUTHWICK.

Attest: WILMARTH H. THURSTON,
Special Examiner.

100 Testimony taken on the part of the defendant under and pursuant to the 67th rule of the Supreme Court of the United states, as amended, before John A. Shields, U. S. commissioner for the southern district of New York, by consent of counsel for the respective parties.

NEW YORK, *June 21st*, 1883—11 o'clock a. m.

Present: William W. Douglas, Esq., counsel for complainant, and Benjamin F. Thurston, Esq., counsel for defendant.

ROBERT W. HAMILTON, a witness on the part of the defendant, being duly sworn, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. Robert W. Hamilton; age, 58; residence, Brooklyn; and occupation, machinist and assistant engineer in the post office of the city of New York.

Q. 2. Please look at the drawings of the letters patent granted to Miller & Decker for a file-cutting machine, April 12, 1859, No.
101 23645, and also examine the model now shown you marked "Miller & Decker model," and state whether at any time heretofore you were acquainted with or knew of a machine for cutting files in practical use substantially the same as the illustration furnished by the said drawing and the said model.

A. Yes, sir; I was.

Q. 3. Where and when did you first become acquainted with such file-cutting machine?

A. At the Empire Works, foot of East 25th street, on the fourth floor. As near as I can recollect, I used some of those files in 1858.

Q. 4. Were you engaged in any business in the same building; and, if so, what?

A. I was foreman of the machine shop engaged in building screw machines, and also letting rooms with power.

Q. 5. What was the name of the screw machine which was being constructed in the shop of which you were foreman?

A. It was the "Sloan" machine.

Q. 6. How often did you have occasion during the year 1858 and

afterwards to see the file-cutting machine at work on the same premises?

A. I suppose I was in the room where the machine was every day while I was there.

Q. 7. State whether you were sufficiently interested in the working of the machine to observe it particularly, and have you any difficulty in recalling the machine as it was then working, after seeing the model and the patent drawing?

A. I was interested the same as I would be with anything new, and that machine I could have told in the dark by feeling over it.

Q. 8. Do you remember who the persons were who were interested as owners of this file machine, and of the business carried on there?

A. Charles Miller and Thompson W. Decker.

102 Q. 9. Do you recall the names of any persons who at that time were engaged in working the machine or attending to the making and selling of files besides Mr. Miller and Mr. Decker?

A. None that I recollect the names of; they were strangers to me.

Q. 10. You have mentioned that you think you used some of the files in 1858. Please state the circumstances under which you obtained the same.

A. From Charles Miller to test the files to see if they would suit me or not.

Q. 11. For how long a period, measured by months or years, did you know of the Miller & Decker file machine being in practical operation cutting files?

A. That machine was there five or six months, but I don't think it was used in cutting files all that time.

Q. 12. Do you know how and in what manner the files produced by the machine were sold or distributed in the market?

A. I do not.

Q. 13. How long did you continue as foreman at the premises mentioned?

A. I went there in 1846 and stayed there twenty-five years.

Cross-examination:

X Q. 14. State how you fix the year in which you say you first saw the file machine in operation.

A. I was acquainted with Mr. Miller for some time. He was quite an inventor. I saw nearly all the machines he got up. In 1857, I think, Mr. Sloan built him the first machine, and in 1858, as near as I can recollect, it was Banks who built the next machine, and in 1857 I went into business for myself. I was unsuccessful in business, and the next year I saw this machine. I fix the time by the time when I ceased business for myself.

103 X Q. 15. You have no memoranda in writing, have you, with reference to the operation of this file machine?

A. No, sir.

ROBERT W. HAMILTON.

Sworn before me—

JOHN A. SHIELDS,
U. S. Commissioner, S. D. of N. Y.

WILLIAM D. SLOAN, a witness on the part of the defendant, being duly sworn, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. William D. Sloan; age, 67 years; residence, 358 Fifth street, South Brooklyn, and occupation at present in the customs service, but am by profession a machinist.

Q. 2. Please look at the Patent Office drawings of the patent granted to C. Miller for a file-cutting machine, dated November 11, 1856, No. 16064, and state whether you ever constructed a working machine for cutting files corresponding with the drawings of said patent and the description thereof in the specification of said patent.

A. I did, and the constructed machine is identical in character with the specification.

Q. 3. In what year did you construct such machine and for whom was it constructed?

A. I built the machine for Mr. Decker, and I got the directions from Mr. Miller somewhere in 1856.

(Defendant puts in evidence a copy of said letters patent granted to C. Miller, dated November 11, 1856, No. 16064, and the same is marked "Exhibit Miller 1856 Patent, J. A. S., examiner, June 20, 1883.")

104 Q. 4. Please look at a Patent Office copy of the letters patent granted to Charles Miller and Thompson W. Decker, dated April 12, 1859, No. 23645, for file-cutting machine. Please also look at the model of a file-cutting machine now shown you, marked "Miller and Decker model," and state whether you recognize from said drawing and model any file machine with which you have had any previous acquaintance or knowledge.

A. I do recognize from the drawings and model a file-cutting machine with which I was once acquainted. We spoke of it as the Miller machine.

Q. 5. Please state in what year you knew of such file-cutting machine, and please state any and all facts within your knowledge which will enable the court to know whether such Miller file-cutting machine was constructed and put to work prior to July 1st, 1860.

A. As near as I can remember, it was the latter part of 1857 or the beginning of 1858. It may have been well along in 1858, but I can't tell definitely. I was naturally interested in it, as I built the first machine and knew all the parties in interest. I did not build this second machine, but was informed that it was built by a man named Banks for Miller and Decker. I saw it in operation in the Empire Iron Works, foot of 25th street, New York.

Q. 6. Did you ever see the machine corresponding with the drawings and model of said Miller and Decker patent in operation cutting files?

A. Yes, sir; at the Empire Iron Works.

Q. 7. Where in 1858 were you located in business, and what opportunities did you have for seeing the Miller and Decker machine in operation?

A. I was located in the Empire Iron Works, and being the cotenant with Miller and Decker I used to wander in and out of the premises occupied by Miller and Decker, as is a common thing with cotenants, and was interested enough to look at it, as I had built the previous machine for Mr. Miller.

105 Q. 8. Can you state positively that you saw such machine at different times during that year cutting files?

A. Yes, sir.

Q. 9. State whether or not it was understood that the business of cutting files by this machine was being carried on as a business.

A. It was so stated to me that Miller and Decker were carrying on the business of cutting files, and that they were engaged in selling machine-cut files, as was commonly understood.

Cross-examination:

X Q. 10. Do you know of your own knowledge how many files were made and sold by the owners of the Miller and Decker machine at the time you knew of its being operated?

A. No, sir.

X Q. 11. Do you fix the time at which you saw the machine in operation with reference to any memorandum made at that time or with reference to any familiar event in your own experience or merely from the best of your general recollection?

A. I made no memorandum. I go on my general recollection as being a tenant in the same building, being in and out there frequently.

X Q. 12. When did your tenancy in that building cease?

A. In 1862.

WM. D. SLOAN.

Sworn before me—

JOHN A. SHIELDS,
U. S. Commissioner, S. D. of N. Y.

JAMES M. FESSENDEN, a witness produced on the part of the defendant, being duly sworn, deposes and says:

106 Q. 1. What is your name, age, residence, and occupation?

A. James M. Fessenden; age, 65; residence, Beaver Falls, Pa., and occupation, file manufacturer.

Q. 2. With what company are you connected in the manufacture of files, and what is your official position in said company?

A. In the Western File Co., Limited, and I am chairman of the company.

Q. 3. When were you first connected with the Whipple File Co. or with the persons who are associated for the manufacture of files by machinery prior to the organization of the Whipple File Co.?

A. I engaged with them in June, 1859.

Q. 4. How long did you continue in the employ of the company?

A. From ten to twelve years.

Q. 5. What situation did you fill?

A. I was superintendent of the file department.

Q. 6. Please look at the model now shown you of a file machine marked "Defendant's Exhibit Whipple Model," and state whether there were any machines for cutting files constructed and put into use by the Whipple File Co. of which such model would be a correct illustration.

A. Our machines at that time cut eight files at a time, but they are just the same as the illustration.

Q. 7. Do you mean that the machines were arranged so that eight files could be cut with a single tooth at each traverse of the rotary cutter?

A. There were two rotary cutters; each cutter cut four files.

Q. 8. State whether each file blank to be cut was held up to the face of the bar so that its surface would be parallel with the path of movement of the traverse of the rotary cutter, substantially as exhibited in the model before you.

A. Yes; that is the manner in which they were pressed up to the face-plate.

107 Q. 9. During what years were file-cutting machines of the character you have stated in use by the Whipple File Co., and when were they first put into use?

A. I first saw them in March, 1859. They were running for several years after that time. For a year or two we had no other kind of machine.

Q. 10. To what extent were files made by such machines sold from the time you first became acquainted with such machines? And state whether you had anything to do with selling files cut on said machines.

A. We kept increasing in our production—putting in more machines—and sold all we made. I would go to neighboring cities sometimes, and perhaps sell fifty dozen at a time.

Q. 11. Have you any memoranda or can you state when files were first sold which were the product of these machines?

A. I have memoranda when some were sent off, but have no memoranda of the sales of the whole establishment, but I happen to have a memorandum of some sales and the persons to whom they were sold. On the 10th of September, 1859, we sold to Bullard & Abbot 12 dozen 12-inch files. On the 29th of September, 1859, we sold them 24 dozen 12-inch files. About that time I sold 50 dozen at Lowell to Burbank, Chase & Co., on October 29th, 1859.

Q. 12. How many files per day were a set of machines of this kind capable of producing?

A. They produce from 12 to 20 dozen per day.

Cross-examination:

X Q. 13. Who made the machine which you saw in March, 1859?

A. Mr. Shattuck, of Shattuck Brothers, of Boston.

X Q. 14. Who made the drawings and pattern of that machine?

108 A. I don't know, but I think it was Mr. Shattuck.

X Q. 15. Was that Boston machine an experimental machine or a perfected invention?

A. When it was completed it was moved to Ballardvale and put into operation.

X Q. 16. When was it moved to Ballardvale?

A. It was moved there in March, 1859.

X Q. 17. When were the next machines after that one completed and put into operation?

A. I can't call that to mind now. Soon after that I know we put in two new machines.

X Q. 18. In the Boston machine what was there interposed between the wedges and the soft metal sheathing of the file blank?

A. There was a shoe, and when you first put it in it was not perfect, and we had to make alterations to get a bearing to make the blank perfect, so that the cutter would follow it.

X Q. 19. Please describe what this shoe was like before the alteration was made and after the alteration was made.

A. I don't think I can describe that. I know it would not work and we changed it to make it work.

X Q. 20. In the next machines that were made was the shoe which you speak of formed in two parts, one of which rested against the soft metal sheathing, and the other of which rested against the faces of the wedges, and were these two parts of the shoe connected by a hinge?

A. I don't feel competent to answer that. It is too long now ago since, and I am not a machinist. I can remember the general parts of it, but not so as to explain it.

Redirect:

Re-D. Q. 21. Please state what, in fact, was the operation of the machine which you knew in 1859, at the Whipple File Co., with respect to the keeping of the surface of the file blank to be cut up to the face plate or stationary bar, without regard to whether the file blank was thicker at one edge or not.

109

(Objected to, as the witness has just stated he is not a machinist, and cannot give specifically the arrangement of the parts spoken of.)

A. I would state that I first personally started the machines after they were brought into the factory. In the first place, it was necessary to have the face plate almost perfect; then it was necessary to have these wedges so adjusted as to overcome any small inequality in the blank. The effect of the arrangement was to cause the face of the blank to be cut to bear against the straight stationary face plate, although the blank was thicker at one edge than at the other.

Recross:

Re-X Q. 22. Was this result accomplished when, as you say, you first started the machine?

A. It was accomplished soon after. It took some little experimenting to get it right.

Re-X Q. 23. Was that in June, 1859, when you first became connected with the company?

A. Yes.

JAS. M. FESSENDEN.

Sworn before me—

JOHN A. SHIELDS,
U. S. Commissioner, S. D. of N. Y.

(Defendant puts in evidence letters patent granted to Milton D. Whipple for an improvement in manufacture of files, dated June 26th, 1860, No. 28947, and the same is marked "Exhibit Whipple File Patent, June 20th, 1883, J. A. S., examiner.")

Adjourned to Tuesday, June 26, 1883, at 10 a. m.

110 NEW YORK, *June 26th*, 1883—10 o'clock a m.

Met pursuant to adjournment.

Present: Counsel as before.

Mr. THOMPSON W. DECKER, a witness produced on the part of the defendant, being duly sworn, deposes and says:

Q. 1. Please state your name, age, residence, and occupation.

A. Thompson W. Decker; age, 62 years; I reside at 836 Lexington avenue, New York, and am in the milk business.

Q. 2. Were you ever acquainted with Charles Miller, of New York, who was an inventor of file machines? And, if so, state when you first became acquainted with him.

A. I knew him, and it must have been twenty-five years or more since I first became acquainted with him.

Q. 3. Please look at the letters patent granted to the said C. Miller, dated November 11, 1856, No. 16064, and state whether you recognize from the drawing an illustration of a file machine which was made by the said Miller.

A. That looks like a machine that he took me down to see in Centre street, at the freight depot. He had that up in some machine shop there. He called my attention to see it.

111 Q. 4. In consequence of any inducements presented to you by the said Miller did you become at or about that time interested with him in file machinery?

A. Yes; it followed that introduction. I became interested in that machine afterwards.

Q. 5. Was said first machine satisfactory or did it turn out to be defective?

A. That machine I don't think was ever set up to work after I became interested in the machine.

Q. 6. Please look at a copy of the letters patent now shown to you granted to Charles Miller and Thompson W. Decker, dated April 12, 1859, No. 23645, and state whether you are the same Thompson W. Decker who appears to be one of the patentees in said patent.

A. I am.

(Counsel for defendant puts in evide ice a copy of the file wrap-

per and contents thereof pertaining to the application of the said Miller & Decker for said letters patent, and the same is marked "Exhibit Miller & Becker File Wrapper, June 26, 1883, J. A. S., ex'r."

Q. 7. I observe in a copy of "Wilson's Business Directory of New York City" for the years 1859 and 1860 the name of Thompson W. Decker, with place of business foot of East 25th street. He is put down among the list of file-makers. Please state whether you were, in fact, in the year 1859 or previous thereto, interested in the business of making files in any premises at the foot of East 25th street, in New York city; and, if so, please give the name of the building in which you were located.

A. I was, and in the Empire Works building.

(Counsel for defendants puts in evidence a copy of the "Business Directory of New York City," bearing the imprint, "New
112 York, John F. Trow, printer and publisher, 379 Broadway, 1859," and the same is marked "Exhibit New York Directory, June 26, 1883, J. A. S., ex'r.")

Q. 8. Referring again to a copy of the Miller & Decker drawings attached to your patent and examining a model professing to represent the machine described in said patent and shown in the drawings now shown you, marked "Exhibit Miller & Decker Model," state whether a file-cutting machine was constructed by you and Mr. Miller corresponding with said model and drawings at any time; and, if so, when and in what place was it put to work?

A. There was a machine made corresponding to that. It must have been from the date of this first patent in 1857 or 1858, and it was put to work in the Empire Works.

Q. 9. How do you fix the date by reference to the Miller patent of November 11, 1856? And if there are any circumstances in relation to the improvements of the original machine of Miller or in relation to your business connection with him please state them.

A. Because in 1859 we were running the second machine, and the improvements were made between the times.

Q. 10. Please state how early, according to your best recollection, after you were introduced by Miller to his first machine that you and he commenced to make the improvements which resulted in the joint patent to you and him which was applied for January 18, 1859.

A I don't see how I can fix the time, unless I could find some reference which I don't think of now. It must have been necessarily between the two periods. I cannot tell whether it was the first year or the second year.

Q. 11. State whether the Miller and Decker machine was run at East 25th street during the year 1859 to cut files as a business.

A. It was put up there in the Empire Works to make files.

113 Q. 12. State whether the files made by it were sold in the market.

A. Henry Holden, who was the practical file man, did make files, and, according to his own report, he did sell them.

Q. 13. At this time you were engaged in your milk business, as I understand, and is it true that you were the person who furnished the money for building the machine and for the business of file-cutting?

A. I did.

Q. 14. State whether the said Miller and Decker machine operated successfully or otherwise.

A. To the extent of cutting nice files it did. That is my recollection of it.

Q. 15. Was there ever any other kind of file-cutting machine than the Miller and Decker machine run by you or under your direction at the premises of the Empire Works, in East 25th street?

A. No.

Q.— . State whether the business of cutting files by the Miller and Decker machine was commenced prior to the year 1859 in the premises referred to.

A. I believe that we were to work there when that patent was granted for cutting files; that is the best of my recollection.

Q. 17. The Miller and Decker patent was applied for in the Patent Office, as appears by the file wrapper, January 18, 1859. State whether, according to your best recollection, the machine had been put into operation and tested before you and Miller applied for a patent.

A. I suppose it was. I have no doubt about it.

T. W. DECKER.

Sworn before me—
TIMOTHY GRIFFITH,
U. S. Commissioner, S. D. of N. Y.

114 PROVIDENCE, *April* 3, 1885.

Present: Chauncey Smith, Esq., and William W. Douglas, Esq., of counsel for complainant; Benjamin F. Thurston, Esq., of counsel for defendant.

Deposition of William T. Nicholson.

Direct examination by BENJ. F. THURSTON, Esq.:

Int. 1. What is your name, age, residence, and occupation?

Ans. William T. Nicholson; age, 51; residence, Providence, R. I.; occupation, president and general manager of the Nicholson File Company.

Int. 2. State fully what has been your experience and training as a mechanic, whether you have been engaged in constructing and designing machinery, whether you have been a patentee, and in how many instances of inventions and improvements, and particularly what has been the extent of your study into and practical acquaintance with machinery for making files.

Ans. I have been engaged in mechanical business for about thirty-five years. I have had the supervision of men and the construction of machinery under my charge and management since 1856, when I

was employed as foreman in the shop of Joseph R. Brown, now the Brown & Sharpe Manufacturing Company. My early experience during the period of three or four years with Joseph R. Brown and Brown & Sharpe by nature peculiarly fitted me for the investigation and manufacture of files. During my experience with the aforesaid parties, I had done all of their fine rule work, and the graduation of their rules and micrometer gauges was under my charge, and
115 most of it was done by the job by me. I made the drawings and the first circular dividing machine used by them.

In 1857 I commenced business on my own account, under the firm name of Nicholson & Brownell, on Eddy street, in this city, for the purpose of manufacturing jewellers' tools and light machinery generally.

Later Mr. Brownell retired, and I associated with me Henry A. Munroe, and we bought out the machine shop of Foster & Luther, then manufacturing gun machinery. This branch of our business was very much enlarged during the early part of the war, and we built under my supervision the rifling machines largely used by the Burnside Rifle Company and the Spencer Repeating Rifle Company, both of which companies had large contracts with the Government, for their increased twist bored rifles. We manufactured also milling machines, lock-plate edging machines, three and six spindle drills, and other of the nicer tools used in the manufacture of guns. We also took subcontracts for the manufacture of the rear sights, side washers, bands, and swivels for the Springfield rifle, all of which had to be made to Government standard gauges, and had to be interchangeable to be accepted by the Government.

During this period, I found time to develop my invention for a file-cutting machine, which was subsequently patented in 1864.

My experience since I first began supervising men under Joseph R. Brown has been almost daily in the devising of machines or devices for the saving of labor and in the construction of machinery.

I have taken out several patents, probably as many as twenty, relating to files and machinery for producing them.

Before producing my first file machine, I gave very careful study to the inventions that had been previously made, and endeavored to produce a machine which should be superior to any which had hitherto been made for the production of files. In the course of my examination I found two machines which it was evident to my mind that I should conflict with in any attempt to run my machine without first having obtained the patents or the right to work under them. The result was that I made the purchase outright of
116 the patents which had been granted to John Crum and to James H. Thompson. After securing these patents, I associated with me Byron Sprague and a capitalist, and a stock company was formed for the manufacture of files on a large scale, under the name of the Nicholson File Company, which company was organized in 1864, with a capital of three hundred thousand dollars ($300,000), subsequently increased to four hundred thousand dollars ($400,000). At this time—that is, about the time of the organization of the Nicholson File Company—I sold out my interest in the business of

manufacturing machinery and parts of guns, and devoted my attention exclusively to the manufacture of files and to the development of machinery therefor.

As the machinery and appliances for the production of files by machinery in its various operations was only known to those who were in the business, my attention has since been entirely absorbed in the development of appliances and machinery which could not be purchased.

Int. 3. Who constructed and devised all the machinery for the manufacture of files used by the Nicholson File Co.?

Ans. I did, with the exception of certain machines for cutting round files, one rolling mill, and one file-grinding machine, and with the further exception of such machinery as is used for other general purposes, such as trip-hammers.

Int. 4. How extensively is the Nicholson File Co. now engaged n the manufacture of files by machinery?

Ans. The Nicholson File Co. is probably the largest file manufacturer in the world. Its capacity at the present time is a production of fifteen hundred dozen files per day.

Int. 5. State whether you are familiar with the letters patent in suit in this case, No. 29236, granted to Etienne Bernot, July 24, 1860, and do you understand the machine described therein and illustrated in the drawings of said patent.

Ans. I am familiar with the patent referred to, and suppose that I understand the nature of the invention described in the patent and illustrated in the drawings.

Int. 6. State what you understand to be the machine de-
117 scribed is said patent, with reference particularly to the feature of construction specified in the third claim of said patent, and which claim is—

"Thirdly. In the arrangement of a guide set parallel to the graver, as hereinbefore described and referred to in figures 1 and 2, drawing I, and figure 2, drawing II."

Ans. I understand the Bernot machine to contain a rolling bed, fed by mechanism as described, which bed is capable of being adjusted to any angle desired with reference to a horizontal plane, and it may also be adjusted to the several degrees desired with reference to a vertical plane; that it has a cutter stock which travels vertically, and to which is fastened a cutter or chisel. This cutter stock is made to move up by means of a cam and is thrown down by a spring to deliver the necessary blow upon a file. A device is shown for giving an increased impulse to the blow, as may be found necessary to adapt the machine to the various widths of files. The mechanism for feeding the carriage which carries the rolling bed is capable of being made to give fine or coarse feed. These several devices I do not understand to be especially new in principle in file-cutting machines.

The device especially referred to in the third claim of the patent I understand to be a device for holding a guide ro presser foot, and an arrangement by which the presser foot may be set parallel with the cutter's edge. The patent provides for moving this presser foot,

when once adjusted, up and down, being held down by a weight, so that the presser foot shall bear upon the file and hold the same firmly upon the rolling bed while the teeth are being cut.

Int. 7. What are the means shown in the drawings referred to in the claim for bringing the guide, or presser foot as you term it, into parallelism with the edge of the cutter, and adjusting such presser foot to the edge of the cutter as occasion requires.

Ans. The guide U, or presser, I understand to travel in a groove planed in the plate p^1, called "counter plate or disc" in the patent, and is free to move up and down in said groove. The plate p^1 is pivoted at r so that it can be rocked on such pivot, carrying with it as it rocks the presser U, and consequently the foot of the presser can be adjusted into parallelism with the edge of the cutter.

118 The plate p^1 is fastened, when such adjustment is made, by means of clamp bolts.

Int. 8. You have referred to a prior file machine patented to John Crum, and which patent you have stated was purchased by you. Do you refer to the letters patent to John Crum, dated July 1, 1851, No. 8199?

Ans. I do.

Int. 9. State whether or not there is shown in the Crum patent a reciprocating chisel delivering a blow from the impulse of a spring to cut teeth in the file blank; a rolling bed, upon which the file blank to be cut is mounted, inclined to the plane of the horizon, and means for intermittingly moving the file bed with the file thereon under the reciprocating cutter.

Ans. In the Crum machine there is a reciprocating stock and chisel, to which impulse is given by a spring, which spring is capable of being increased or diminished, as may be required. Said means for regulating the force of the spring is given by an irregular-shaped wedge fastened to the carriage, which travels under the cutter during the motion of the carriage. The carriage travels in a horizontal plane and carries a semi-cylindrical rolling bed. It also has means for feeding said carriage with an intermittent motion, coarse or fine, as may be desired. The cutter stock travels in ways inclined at about fifteen degrees from a vertical tranverse plane.

Int. 10. State whether it is a matter of indifference in file machinery whether the bed is inclined to the horizon with a cutter moving in a vertical plane, or whether the bed move in a horizontal plane and the cutter move in a plane inclined to such horizontal plane of the bed.

Ans. I do not consider that it makes any essential difference.

Int. 11. What is the fact with regard to prior machines in that respect? Were some constructed one way and some the other?

Ans. Yes.

Int. 12. Referring now to the file-cutting machines used by the Nicholson File Company, state whether the model, "Defendant's Exhibit Model Nicholson File Machine," correctly represents

119 the construction of such machines with respect to the inclined rolling bed and intermittingly moving carriage, the recipro-

cating cutter stock and cutter, and the presser for holding the file blank upon the bed.

Ans. It does. There is not shown in the model the mechanism for intermittingly moving the bed or the mechanism for giving movement to the cutter stock.

Int. 13. State whether in the machines of the Nicholson File Company there exists any means for adjusting the foot of the presser so as to bring it into parallelism with the edge or acting face of the cutter.

Ans. There is none.

Int. 14. State whether or not such presser is a fixture in the Nicholson machine.

Ans. It is. It is capable, however, of being taken off and replaced, but without changing its relative position.

Int. 15. What do you ever want to take it off and replace it for?

Ans. After it has been used until its surface becomes slightly worn or irregular, it is taken off and the bearing surface is lapped down to a true straight line.

Int. 16. Or I suppose a new presser can be inserted in its place if too much worn. Is that so?

Ans. Yes.

Int. 17. In the machines for cutting files used by the Nicholson File Company, are there any means existing for adjusting the edge of the cutter into parallelism with the edge or bearing face of the presser?

Ans. No.

Int. 18. I observe that in the model the cutter stock which carries the chisel is capable of being turned axially. Why is that provision made in the machines used by the Nicholson File Company?

Ans. To enable us to cut teeth at various angles on the file blank.

Int. 19. What are the technical names of the cuts which are made upon a file blank, and at what angles are they to the longitudinal axis of the blank?

Ans. The first cut is usually called the "over-cut," and is usually at about an angle of forty-five degrees. The second cut, which
120 crosses the first, is called the "up-cut," and is usually about fifteen degrees in the opposite direction. These two cuts refer to what is known as double-cut work. Single-cut work is usually at about fifteen degrees.

Int. 20. Are these angles of forty-five degrees and fifteen degrees respectively absolute or only approximate?

Ans. Approximate.

Int. 21. State what means are employed by the Nicholson File Company for grinding with accuracy the cutters used in its file machines.

Ans. A machine is employed having a slide rest set parallel to the shaft on which a grindstone is made to revolve. The cutters are placed in a holder upon a carriage, which carriage is made to travel automatically across the face of the stone, care being had to see that the receptacle or surface against which the back or upper edge of the cutter rests shall be always kept parallel to the line of motion of the

said carriage, thus enabling us to grind the cutting edge of the cutter parallel with its back.

Int. 22. I observe that in the illustrative model of the Nicholson machine the plane of the surface of the base of the jaw-holder in which the cutter is contained is inclined to the axis of the holder, instead of being at right angles therewith. State how such angle of inclination in any given machine for cutting any given variety of file is fixed and determined.

Ans. Having determined the angle at which it is desired to cut the teeth of the file, the angle at which the seat for the cutter in the jaw should be planed is first obtained on the cut-and-try principle, that being the simplest way. Having once been obtained correctly, the seat is planed out in new holders by planing them at precisely the same angle which the original was found to require.

Int. 23. State whether the back edge of the tool must always rest firmly upon the seat in the holder.

Ans. Yes.

Int. 24. State whether as a fact the cutting tool is ever canted in the holder to bring its edge into parallelism with the edge of
121 the presser, and any space so formed between its back edge and the seat filled with a wedge. Would such working of the machine be practicable?

Ans. No; it is not, and I do not think that such device would be practicable.

Int. 25. What would be the effect if such were done?

Ans. I think it would be impossible to keep a wedge in the position referred to, owing to the constantly loosening tendency caused by concussion.

Int. 26. In cutting a fourteen-inch file, for example, how many blows per minute does one of your machines make, and what is the average force of the blow, as near as you can estimate it?

Ans. I cannot state positively, but my impression is that the machine makes about two hundred and fifty blows per minute on that size file. I cannot give an answer as to the force of the blow in pounds even approximately, but will state that in hand-cutting that class of work requires powerful, able-bodied men, using a hammer from ten to twelve pounds in weight, impelled with considerable force.

Int. 27. The tooth must be cut in a file-cutting machine to its full depth by a single blow, must it not?

Ans. I have never known a machine to cut in any other way.

Int. 28. I observe that in the illustrative model of the Nicholson machine the foot of the presser is ground angularly. State how the angle would be obtained if, for example, you were starting a machine for cutting a fourteen-inch bastard file with the first cut or "over-cut" at an angle of forty-four and a half degrees.

Ans. If it were desired to cut files at an angle of forty-four and a half degrees in sufficient quantities or with a degree of absolute accuracy the first operation would be to so shape the presser foot that its bearing should correspond with that angle, on the "cut-and-try" principle before referred to. I should then turn the chisel-

holder to the same angle—forty-four and a half degrees. If the presser foot was not then found to be parallel with the cutter's edge the foot of the presser would be lapped or ground off until the two were parallel.

122 Int. 29. What is meant in mechanics by "lapping" the edge of a tool?

Ans. Lapping is understood to mean a very fine system of abrasion or grinding and is done by charging a lead or soft composition plate with emery or crocus, or, in very fine work, with diamond dust. Such plates are usually charged upon the face of wheels which are made to revolve with great rapidity, and the work to be lapped is held against the surface of the plate.

Int. 30. Please now give a statement in detail how you would set up for operation a Nicholson machine for cutting, for example, a fourteen-inch bastard file. Assume that the machine is complete and on the floor of the cutting-room, that all it requires is a proper presser to be put in it and a proper cutting tool, and that you propose to make the "over-cut" forty-five degrees. State each step in its order which you would take to put the machine into proper working condition to cut a file such as I have supposed with the "over-cut."

Ans. I should first make a gauge like "Defendant's Exhibit Nicholson Gauge for Determining the Angle of the Chisel with Reference to the Path of the File to be Cut," having an angle of forty-five degrees. My next step would be to prepare a chisel-holder with its seat for the reception of the back of the cutter at such an angle that when the cutter was placed therein and the chisel-holder brought down so that the edge of the chisel should bear upon the file blank the rolling bed, upon which the file rests, should be about level across the bed.

My next step would be to fit a presser foot to correspond with the gauge in its angle across the file and with its bearing surface ground or lapped until parallel to the cutter's edge. The machine is now ready to start.

Int. 31. I assume from your answer that you mean to have it implied that the edge of the cutter is always to be parallel with its back, and consequently always parallel with the seat in the holder on which the back of the chisel bears. Am I correct?

Ans. Yes.

Int. 32. You have referred to a machine in regular use for
123 grinding cutters of file machines with accuracy. State whether there is a person or persons whose duty it is to do the grinding of the chisels.

Ans. Yes; it is one man's work.

Int. 33. When an operative attending a file machine finds that his cutter has become dull do you wish it to be understood that it is his duty to substitute a sharp cutter in its place and lay aside the dull cutter to be sharpened by the workman who has charge of the grinding machine?

Ans. It is.

Int. 34. Please look at the letters patent to Thompson W. Decker

and Charles Miller, dated April 12, 1859, No. 23645, and at the illustrative model of the machine described in said patent, in evidence as the "Miller & Decker model," and state whether said patent does or does not show and describe the thing specified and claimed in the third claim of the Bernot patent.

Ans. In my opinion it does.

Int. 35. In your opinion, as a practical constructor of file machinery, would a file-cutting machine constructed according to the information contained in the said Miller & Decker patent be a practically operative and useful machine, assuming, of course, that the machine is constructed with proper mechanical skill?

Ans. I should not hesitate to hazard my reputation as a mechanic in warranting that a machine could be built that would give the very best results known even at this date when constructed practically in accordance with my understanding of the Miller & Decker patent.

Int. 36. Please look at the letters patent granted to Milton D. Whipple February 1, 1859, No. 22842, and to the illustrative model of the machine therein shown, marked "Defendant's Exhibit Whipple Model," and state whether you do or do not find shown and described in said patent any—and, if so, what—means or devices for preserving a parallelism between the face of the file to be cut and the path of movement of a rotary cutter moving in a horizontal plane.

Ans. I have examined the patent somewhat, and also the machines which were actually used by the Whipple File Company. I do find means for preserving parallelism in the model re-
124 ferred to and shown and described in the said Whipple patent. The means consist of ways upon which a carriage is made to travel forward and back, carrying a rotary cutter. Files are held (in practical machines usually four) in shoes which are made to travel by suitable mechanism past the edge of this rotary cutter, the face of each of these files being pressed while the cut is being made against a face-plate, marked in the patent *n*, by means of two weighted wedges pressing against two pieces which bear against the shoe which carries the file. The face-plate *n* is made parallel with the ways upon which the carriage and cutter travel, and, as there are two wedges used to press the shoe and the face of the file required to be cut against this face-plate, it necessarily follows that that portion of the file which is to be acted upon by the cutter must be parallel to the line of the ways and the cut made of equal depth across its face.

Int. 37. In your opinion, would machines constructed according to said Whipple patent be practically useful?

Ans. Machines were constructed in large numbers, upon which files were made for the market, by a company which had several years' existence, and a large product was disposed of, with various opinions as to the quality of the goods, the principal defect in such work being the barb, which was rolled off at one edge of the file blank, but not in the cutting qualities nor in the uniformity of depth from side to side at which the cut was made. In 1875 the

Nicholson File Company purchased all of the Whipple File Co. machinery, something like a hundred tons, and, to ascertain the real merits of the machine in question, did start one of the machines constructed in accordance with the patent referred to, and did produce work which we were satisfied to put onto the market as first-quality work.

Upon second thought I must qualify this answer by stating that the machine we did start had a hammer which was made to strike against the face of the file, instead of a rotary cutter, the machine referred to being of a more recent date, and a rolling bed was used in place of the wedges.

Adjourned to Monday, April 6, 1885.

125 PROVIDENCE, *April* 6, 1885.

Present: Same counsel as before.

Cross-examination by CHAUNCEY SMITH, Esq.:

X Int. 38. When you turned your attention, as you have said, to the construction of file-cutting machinery, what other patents, if any, beside the Crum patent and the Thompson patent did you examine?

Ans. When I first conceived the idea of making a file machine dates back to the time when I was in the employ of Joseph R. Brown in 1856, as near as I can recollect; but before taking out my first patent I went to Washington and made examination of all the patents that had then been issued by the Government, so far as was practical within the two or three days which I was there. My visit to Washington, as I recollect, was in the winter of 1863–'4.

X Int. 39. Previous to that visit to Washington had you seen and examined patents for file-cutting machinery? If so, what patents and when?

Ans. Previous to 1864 I had examined the Whipple File Company's machinery with a view of manufacturing some of the machines for them. I had also examined the Bernot machine with a view of manufacturing machines for the (old) American File Company, at the request of Mr. James S. Brown, its former president. I cannot state definitely whether it was in 1862 or 1863 that I examined the Bernot machine. During 1863 and 1864 I was also approached by Mr. Vail, of Hartford, who then had the remains of the Cook machines, built under a patent taken out in 1860, with a view of my taking the machinery and starting.

X Int. 40. State as nearly as you can when you first saw the Crum patent, the Thompson patent, the Bernot patent, and the Miller & Decker patent respectively.

126 Ans. During the spring and summer of 1863, while working up the drawings for my machine, I spent my evenings in looking over the Patent Office reports relating to file machinery. It was during that period that my attention was called to what others had done and to the patents above referred to.

X Int. 41. When did you get your assignment of the Crum patent?

Ans. December 31, 1863.

X Int. 42. When of the Thompson patent?

Ans. March 29, 1864.

X Int. 43. In 1862 or 1863, when you saw the Bernot machines, did you make yourself sufficiently familiar with them to make an estimate of a price for which you would manufacture similar ones?

Ans. My impression is that I did give a price.

X Int. 44. Did you see any other file-cutting machines than those you have mentioned before you applied for your patent?

Ans. My impression now is that I saw the Crum machine before I made application for my patent. At all events, I bought the Crum machines at or about the time that my application was made. I don't think now of any other machines that I saw.

X Int. 45. What is the use of the presser in the Nicholson machine?

Ans. First, to hold the file blank firmly upon the rolling bed during the operation of cutting; and, second, to hold the surface of the file blank being acted upon parallel to the cutter's edge.

X Int. 46. Does the presser in the Bernot machine perform the same use or function as the second one you have mentioned in your last answer as performed by the presser in the Nicholson machine?

Ans. I think it does.

X Int. 47. Did the Nicholson File Company, between the first day of December, 1876, and the seventh day of May, 1879, at any time operate and use in the manufacture of files the file-cutting machines shown to Mr. Edward E. Quimby in operation at the works of said Nicholson File Company, on the sixth day of July, 1882, and referred to in the fourth answer of Mr. Quimby's deposition in this case?

127 Ans. The machines shown to Mr. Quimby and to Mr. Smith on July 6, 1882, were machines in regular use by the Nicholson File Company during the period referred to, and such machines are correctly represented by the illustrative model, "Defendant's Exhibit Model Nicholson File Machine," so far as the parts shown in the model are concerned.

Redirect examination by Mr. THURSTON:

Re-D. Int. 48. You have stated, in answer to X Int. 45, that the second office of the presser in the Nicholson machine is to hold the surface of the file blank being acted upon parallel to the cutter's edge. Explain yourself more fully, and state whether there is any capacity in the presser to be brought into parallelism with the cutter's edge, in case the angle of the face of the cutter is at a different angle from the face of the presser, so that when the cutter has been ground and set in the machine it is not parallel with the bearing face of the presser.

Ans. I will state that there is no means of adjusting the presser with reference to its cutter's edge, except by grinding or lapping its bearing surface.

Re-D. Int. 49. Then do you not mean to be understood as saying,

in answering X Int. 45, that the office of the presser is, in the Nicholson machine, to confine the movement of the surface of the blank within the plane or planes determined by the presser, without any regard whatsoever to what may be the cutting edge of the tool?

Ans. You are correct. I did not mean to be understood as conveying the idea that the presser kept the surface of the blank parallel to the cutter's edge in any other condition than in the one single condition in which my machine was devised and is in practice being worked, namely, when the angle of the bearing surface of the presser and the angle of the cutter's edge were precisely the same across the face of the file.

128 Recross-examination by Mr. SMITH:

Re-X Int. 50. In your machine is it necessary or desirable that the line on the surface of a blank where a cut is to be made shall be parallel to the edge of the cutter?

Ans. To cover the file properly I should say it was. By "cover" I mean to make the cut of equal depth across the surface.

Re X Int. 51. In your machine doesn't the presser foot perform the duty of bringing or holding the surface of the file into such relation with the cutter that the cutter will make the cut of equal depth on both sides?

Ans. Yes, that is the duty when constructed as referred to in my answer to redirect interrogatory 49.

Re-X Int. 52. That was what you referred to in stating the second function of the presser in your answer to X Int. 45, was it not?

Ans. Yes, qualified as I have qualified it in answer to redirect interrogatories 48 and 49.

Re-X Int. 53. Do you wish to be understood as saying that in your machine the presser will not, if desired, bring and hold the surface of the blank into such relation to the cutter that the cutter will make a cut of equal depth on each side when the cutter is slightly turned out of parallel with the presser?

Ans. I mean to say that there is no possible way of cutting files of equal depth on each side except in the one condition in which the bearing surface of the presser and the cutting edge of the chisel are in absolute parallelism, both with reference to a vertical plane and a horizontal plane; that in no other condition can the file be properly covered. I should therefore say that if such condition existed as is named in the question files would not be properly cut, and that the cut would not be of equal depth.

W. T. NICHOLSON.

Attest: WILMARTH H. THURSTON,
Special Examiner.

129 PROVIDENCE, *June 3d*, 1885.

Present: Chauncey Smith, Esq., and William W. Douglas, Esq., of counsel for complainant.

Deposition of Edward E. Quimby (Recalled).

Direct examination by CHAUNCEY SMITH, Esq.:

Int. 1. Have you read the deposition of William T. Nicholson, given in this case on the 3d and 6th of April last?

A. I have.

Int. 2. In your previous deposition in this case in your answer to interrogatory twenty-four (24) you suggested a mode in which the chisel in the defendant's machine might be adjusted to the guide. Will you state whether you find in Mr. Nicholson's description of the mode of using his machine that that method of adjustment is actually employed? And if there was any incident that led you to suggest that mode, state what it was and if you now think you have been in any way misled.

A. In my answer to the 24th question I referred to the capacity for adjustment which the Nicholson chisel has by reason of its being mounted in a stock which can be rotated upon a vertical axis. I also referred to a mode of altering the elevation of one or the other end of the cutting chisel by the insertion of a gib or wedge be-
130 tween the top of the chisel and the upper end of the seat in the stock. I was led to refer to the latter mode of adjustment in consequence of what I understood to be the explanation made by one of the operatives in the Nicholson shop, at whose machine I was standing, in response to my request to him to show me how he adjusted the cutter if the nicks were not of uniform depth. Upon reading Mr. Nicholson's testimony to the effect that such wedges were never employed in this country I infer that I was misled or misunderstood my informant on the occasion to which I refer.

Int. 3. Will you look at the model marked "Defendant's Exhibit Model Nicholson File Machine, W. H. T., spec. ex.," and state whether or not you find in it a construction that will admit of an adjustment of the cutter in the manner first referred to by you in your answer to the 24th cross-interrogatory, before referred to?

A. I have examined the model referred to and I do find in it the construction which admits of the adjustment of the cutter in the manner to which I first referred in my answer to the 24th cross-interrogatory. The said adjustment is obtainable when necessary by turning the cylindrical stock, in the lower end of which the tool is mounted, upon its vertical axis. Provision is made for holding the tool stock stationary by means of a jam nut, which may be loosened, if necessary, to permit the tool stock to be turned in its bearings.

Int. 4. Have you read the testimony of Mr. Henry B. Renwick in this case? If so, will you state whether he makes any reference to this mode of adjusting the cutter to the guide, and quote the language in which he refers to it?

A. I have read Mr. Renwick's testimony and he does refer to this mode of adjusting the cutter relative to the guide—"After a tool has cut a certain number of files it becomes dull and must be removed and replaced by a new one. If the grinding machine does its work properly and the action of the lap has not affected the parallelism of the edge of the tool or cutter with its back, then the new cutter when put in will go on and work as accurately as the old one, provided the presser has not so worn that it will hold the file at the wrong angle in the rocking bed. When a new cutter is put in the operator lets it
131 down upon the file which is held down by the presser, and looking under the cutter can determine whether its edge conforms with practical accuracy to the surface of the file, and if he sees that it does not do so he twists the cutter slightly by tapping the set-screw in the stock until the required conformity is obtained, this tapping of the cutter causing it to rotate on a vertical axis, and he can only so rotate the cutter through a very small angle, because in so doing he first destroys the parallelism between the acting surface of the presser foot and the edge of the cutter; and, second, alters the angle of the cutter and consequently of the tooth relatively to the axis of the file, so that the tooth can no longer be cut exactly at the required angle. Third, when the cutter is thus tapped out of its predetermined or proper angular position and out of parallelism with the acting surface of the presser, the cutter must in cutting files which are bellied or of curved contour on their faces make a cut somewhat deeper on one edge of the file than on the other edge, the greater depth of cut shifting from one edge of the file to the other edge in some, if not most, forms of bellied files.

"This adjustment by tapping enables the cutter to make the cut more even from edge to edge than before it was tapped, but does not cause it to make a cut of even depth from edge to edge, but, on the contrary, forces it to make a cut of uneven depth, and to a certain extent—to the extent of the rotation of the cutter on its vertical axis—interferes with the predetermined angle of the teeth, causing them to be cut at a different angle, and it does so because the parallelism between the edge of the cutter and the acting surface of the presser is destroyed by rotating the cutter on a vertical axis."

Int. 5. Do you find anything in this statement indicating that Mr. Renwick entertains any different opinion as to the manner in which the adjustment of the cutter to the guide may be secured and the consequences resulting from it from that which you entertain? If any part of his statement requires, in your judgment, any further explanation in order to exhibit the full effect of an adjustment in this mode, will you state what it is?

A. I do not find that Mr. Renwick's opinion differs from mine as to the capacity for adjustment possessed by the Nicholson
132 machine and as to the mode in which the cutter is adjusted relatively to the presser by tapping the tool stock and thereby causing the tool to be turned upon its vertical axis. I should add in further explanation of the matter referred to in the latter part of his statement that in cutting files with plane surfaces this mode of adjustment would facilitate the cutting of nicks of even depth

from one end to the other, and that in cutting bellied files the close proximity of the Bernot presser to the cutter would cause such a presentation of the blank as to make the cut of substantially the same depth at both ends, because owing to this proximity there would be no great difference between the thickness of the blank on either side at the two places immediately under the presser and the cutter, respectively—that is, the thickness of the blank at one side immediately under the cutter would not be materially different from the thickness of the blank immediately under the presser upon the same side.

Int. 6. Do you find in Mr. Nicholson's testimony any direct statement to the effect that the mode of adjustment described by Mr. Renwick in the passage of his testimony that you have just quoted is not employed in the practical use of the defendant's file machines?

A. I do not.

Int. 7. Mr. Renwick in the passage which you have quoted uses this language: "When a new cutter is put in the operator lets it down upon the file which is held down by the presser, and looking under the cutter can determine whether its edge conforms with practical accuracy to the surface of the file, and if he sees that it does not do so he twists the cutter slightly by tapping the set-screw in the stock until the required conformity is obtained." Can this operation described by Mr. Renwick be produced in the model exhibited by Mr. Nicholson?

A. It can. I have placed the chisel in the tool stock and pressed it hard against its seat and tightened the set-screw which is inserted in the side of the tool stock and bears upon its inner end upon the chisel. I have now caused the presser to bear firmly upon the blank, and upon dropping the chisel I find that the cutting edge is not parallel with the surface of the blank and touches only one side of the blank. The jam not being sufficiently loose, I have
133 by tapping on the set-screw caused the tool stock to be turned upon its vertical axis, and consequently have turned the chisel upon its vertical axis, by which operation I have brought the cutting edge of the chisel into a position in which it is parallel with the part of the surface of the blank immediately under it or rather parallel with a straight line extending diagonally across the blank from edge to edge immediately under the cutting edge. The file blank which is fastened in the model is a bellied blank, and consequently when the chisel is properly set the central portion of the cutting edge bears upon the central portion of the blank and the edges of the blank are not in contact with the cutting edge, but are equidistant therefrom. If the surface of the blank were a plane the cutting edge of the chisel would be in contact with it from one edge to another.

Int. 8. Mr. Renwick has pointed out in the passage of his testimony which was quoted by you that when the edge of the cutting tool is exactly parallel with its back and is properly adjusted in the machine the edge of the cutter or the line of the cut on the file blank would be parallel with the edge of the guide, and if the edge

of the cutter is not parallel with its back, and the cutter is turned so as to bring its edge parallel with the face of the blank, or with the line across the face of the blank where the cut is to be made, then the edge of the cutter will not be parallel with the edge of the guide in the plane of the blank. Will you state whether or not this want of parallelism between the edge of the cutter and the guide, resulting from a want of parellelism between the edge of the cutter and its back, would prevent the machine from cutting good files, or would prevent the guide from performing the function of rolling the bed of the file blank during the operation of cutting the file as described in the Bernot patent, and whether or not this adjustment of the chisel upon a vertical axis does not furnish a convenient means of compensating any errors that may arise in the grinding of the chisels and enable the same tool-holder to be used for cutting at different angles across the file.

A. The want of parallelism referred to in the first branch of the question would not prevent the guide from properly performing its function of rolling the bed upon which the file blank rests in the Nicholson machine during the operation of cutting the file,
134 as described in the Bernot patent, and this want of parallelism would not prevent the machine from cutting good files. I understand that the slash, or angle of the cut relatively to the longitudinal axis of the file, is not necessarily an absolute angle which requires to be always preserved, but, as Mr. Nicholson stated in substance, in his answers to the 19th and 20th questions, is only an approximation to a prescribed angle. Variations from this angle would be caused by variations in the grinding of the chisel, but I understand that the range of variations from this cause, or from the wearing of the presser, is not sufficiently great to be important or to prevent the machine from always cutting good files. As to the latter branch of the question, it is, I think, obvious that the capacity of adjustment of the Nicholson chisel upon a vertical axis both furnishes a convenient and effective means of compensating for any errors or variations that may arise in the grinding of the chisels or the wearing of the presser, and also enables the same tool-holder to be used for cutting at different angles across the file.

Int. 9. Do you find any suggestions, either in the testimony of Mr. Renwick or Mr. Nicholson, that the guide in the defendant's machine is introduced for any other purpose than to perform the duty in that machine, which in the Bernot patent is attributed to the guide in that machine?

A. I do not. On the contrary, I find that both Mr. Renwick and Mr. Nicholson describe the functions of the guide in the Nicholson machine in terms which exactly agree with the descriptions of the guide contained in the Bernot patent.

Int. 10. Do you find from the description of the defendant's machine by Mr. Renwick and Mr. Nicholson that the function of the guide in the defendant's machine, or the duty which it performs during the operation of cutting a file, is any different from what it would be if the adjustment of the cutter to the guide were effected in the precise mode described in the Bernot patent?

A. I do not. The function of the Bernot guide is to effect the presentation of the blank in the proper relation to the chisel, so that the cut when made will be of like depth at both ends, or, if the surface of the blank is a plane, to be of uniform depth throughout its entire length. The guides in both machines do exactly this thing, and they both do it by pressing upon the part of the blank immediately adjoining the part which is to receive the cut, and by that pressure they cause the blank to accommodate itself to its rolling bed, so that it acquires the designed position.

135

Int. 11. Mr. Thurston, in his examination of Mr. Renwick, in his 5th interrogatory undertakes to state his understanding of some of your answers in your previous deposition, but not following your language precisely and not taking, as I understand it, into account your statements as to the necessity of some adjustment of the cutter to the guide, as a matter of fact, in order to ensure such conditions of the mechanism as will enable the guide to perform its duty, and I assume from his manner of stating this question that he referred especially to your answer to the 27th cross-interrogatory. Will you state whether or not the language at the end of the answer to which he apparently refers had reference to any opinion you may have had as to the construction of the third claim, to which you did not in terms refer, or to the opinion in the previous part of the answer you had expressed as to the necessity of some adjustment to the cutter in order to secure the conditions necessary to enable the guide to perform its functions and thus secure the object of the invention?

A. The last part of my answer to the 27th question had reference to the opinion which I expressed in the first part of my answer concerning the necessity of some means for effecting the relative adjustment of the cutter and presser in order to make the machine practically effective for carrying out the object of the Bernot invention. My entire answer was a reply to the question describing a hypothetical structure which, according to my understanding of it, would not be practically useful.

Int. 12. Mr. Thurston, in stating your position, uses this language as being substantially yours: "That if a file machine were so constructed that the necessary parallelism between the acting faces of the presser and the cutting chisel—the presser being incapable of adjustment—were obtained by grinding the chisel so as to bring its edge to parallelism with the edge or acting surface of the presser it would not contain the Bernot invention." Your language at the end of your answer to the 27th interrogatory, to which I suppose he referred, was this: "If the machine should be so constructed as to make it impossible to obtain the necessary parallelism of the parts in question other than by grinding the chisel, I think the structure would not contain the invention of the Bernot patent, because in practice it would not do what the Bernot patent can do." Do you find from Mr. Renwick's description of the defendant's machine or from Mr. Nicholson's description that it is so constructed as to make it impossible to obtain the necessary parallelism of the parts other than by grinding the chisel?

136

A. I do not. On the contrary, I find that the described capacity of rotation upon a vertical axis possessed by the Nicholson chisel stock and chisel gives to the Nicholson machine that quality of adjustment which makes it a practically useful embodiment of the Bernot invention.

Int. 13. Will you look at the patents introduced by the defendants, granted to John Crum and to Milton D. Whipple, and *to* the model marked "Defendant's Exhibit Whipple Model," and state whether the invention which is the subject of the third claim is present in the machines described in those patents or in the model?

A. I have examined the Crum patent and the Whipple patent referred to and the model referred to in the question, and I do not find in either of them the invention which is the subject of the third claim of the Bernot patent. It is essential to the operation of the guide referred to in the third claim of the Bernot patent that there shall be in the machine a rolling bed to support the blank in order that the blank may yield to the influence of the presser, tending to rock it in either direction. There is a rolling bed shown and described in the Crum patent, but there is no presser in the Crum machine which bears upon the blank elsewhere than upon the centre. The Crum presser is incapable of so acting as to rock the blank upon its bed; therefore the guide referred to in the third claim of the Bernot patent is not present in the Crum machine. It is stated in Crum's specification that the roller which
137 & 138 presses the blank down upon its bed is "made tapering from the middle towards its ends, so as to be self-adapting to any change of position of the face of the file."

The Whipple machine is entirely different in organization from the Bernot machine. It has no chisel for cutting entirely across the face of the blank at once and no rolling bed and presser for rocking the blank and thereby presenting it in a suitable position for having the nick cut in it by a chisel, if a chisel were put into the machine. In the Whipple machine the nick is ploughed out by a circular cutter which is rolled across the blank.

EDW. E. QUIMBY.

Right of cross-examination reserved.

139 PROVIDENCE, *November* 13, 1885—11 o'clock a. m.

Present: Wm. W. Douglas, Esq., of counsel for complainant, and Wm. T. Nicholson, Esq., president of defendant corporation.

Deposition of Robert Bell.

Direct examination by WM. W. DOUGLAS, Esq., of counsel for complainant:

Q. 1. State your name, age, residence, and occupation; also whether or not you have ever been engaged in operating file-cutting machines, and where.

A. Robert Bell; forty-one years of age; reside at Cranston, R. I.; at present am employed at the print works. I was engaged for a

number of years in operating file-cutting machines at the Nicholson File Company's works. I first went there in the spring of 1869, and I have worked there three several times. I last left there about three years ago, the middle of March last.

Q. 2. While you were in the employ of the Nicholson File Company did you become familiar with the practical operation of the Nicholson file-cutting machine in use there?

A. I should say I did, with the machines I operated there. That is what is called the twelve-inch machine for cutting the flat side of the file.

140 Q. 3. Will you look at the model before you ("Defendant's Exhibit Model Nicholson File Machine") and say whether it represents with substantial accuracy the parts of the machines which you operated that it purports to represent?

A. I should say that was the model of the machines I have been operating, so far as the tool post, presser, and bed are concerned.

Q. 4. The model shows that the tool post is capable of being turned on its vertical axis, being secured in any desired position by a nut. State whether or not, in actual use, this capacity of being turned on its axis is desirable or necessary; and, if yea, for what purpose.

A. I should say it was desirable, and made use of as a necessary means to cover the file squarely.

Q. 5. What do you mean by the word "cover," as applied to the file blank?

A. In cutting files we endeavor to cut the tooth as deed on one side as the other. That is what we mean by covering the file squarely.

Q. 6. Was it, as a matter of fact, your practice and the practice of other workmen using similar machines to employ this capacity of the machine—that is to say, to turn the tool post on it axis when the chisel did not "cover" the blank squarely in order to make it do so?

A. It was.

Q. 7. In what circumstances in operationg the machine is it necessary to turn the tool post on its axis?

A. It might be desirable, but not necessary—that is to say, it might be done in another way. I might make my chisel cover the file squarely by grinding the presser to the angle to which the chisel was set without moving the tool post at all.

Q. 8. Would that mode of adjustment be practical in the business of cutting files?

A. I should not like to resort to it in cutting files. It
141 would be a slow process. The readier way, provided you keep within reasonable limits of the angle, would be to alter the tool post—that is, to turn it upon its axis.

Q. 9. Which of these ways was followed in actually working the machines?

A. It was customary to alter the tool posts—to change the angle of it so far as you could without getting too far off. What I mean is we were supposed to cut the tools at a certain angle, but we varied

a little from it to humor the machines within certain limits to make it cover squarely.

Q. 10. Was this done while the machine was in operation?

A. It was.

Q. 11. Suppose the edge of the chisel and its back were formed with absolute accuracy, would there be any necessity for changing the position of the tool post?

A. Well, the presser might get a little worn away at one side and cause it to cut one-sided. Then you would have either to turn your tool post or grind your presser. You must either bring your presser to the angle of the chisel or the chisel to the angle of the presser.

Q. 12. In actual practice, when the variation of the presser was slight, how did you correct the error?

A. By changing the angle of the chisel—by slacking the jam nut a little and tapping lightly the head of the set-screw which holds the chisel in its post.

Q. 13. In running the machine was this a frequent or infrequent operation?

A. It was a frequent operation. I should do it very often during the day. If I was working steadily all day I should be obliged to do it a great number of times.

Q. 14. As a matter of fact, were or not the chisels which you used, after grinding and lapping and being inserted in the tool post, absolutely perfect, or was there any inaccuracy of edge or back which impaired the cut and required correction?

142 A. It frequently occurred that there were inaccuracies in edge and back which impaired the cut and required correction.

Q. 15. In such cases was it or not your habit to regrind the chisel?

A. If it so happened that I could rectify it by turning the tool post without getting too far off the angle, I did it in that way.

Q. 16. In setting the chisel in the slot or opening prepared in the tool post to receive it does the back of the chisel set directly against the bottom of the slot, or is anything interposed between them?

A. It often became necessary, and we used to use what we called "packing." This consisted of a thin piece of steel, sometimes a small piece of an old file blank—which we filed up for the purpose as square as possible. Sometimes we used a piece of zinc, and I have used pieces of thick, stiff paper.

(Complainant presents and offers in evidence a twelve-inch flat bastard file, and same is marked "Complainant's Exhibit Nicholson File.")

Q. 17. Look at the file just introduced and state whether or not it is perfect; and, if not, point out the imperfection.

A. There is a defect in the over-cut, or, as we would say, it is not "covered" squarely on a part of one side of the file.

Q. 18. State, if you can, how that imperfection was caused.

A. I would say that there were various causes that would produce an almost similar result. In the first place, I should say the chisel was too dull. A chisel sometimes becomes battered upon one side, or it might be caused by the chisel not being ground squarely or not being set on an angle with the presser. It might be produced also by the file swinging to one side of the bed, causing the presser to tilt the bed.

Q. 19. Could it have been produced by any change of the position of the packing?

143 A. I think it could.

Q. 20. I notice that from a point near the middle of the file to the heel the cuts are correctly made. Can you say how the defect, from whatever cause it arose, was cured?

A. I suppose it was done by altering the angle of the tool post—knocking it around. Possibly I cut that file myself.

Q. 21. Did you, while working at the Nicholson File Co.'s works, ever correct a similar error in the working of the machine during the cutting of a file in that way?

A. I did; very often.

ROBERT BELL.

Deposition of James H. Hervey.

Direct examination by WM. W. DOUGLAS, Esq., of counsel for complainant:

Q. 1. What is your name, age, residence, and occupation?

A. James H. Hervey; 69 years of age; live at South Scituate, R. I.; my occupation now is farming.

Q. 2. Were you ever engaged in the occupation of cutting or manufacturing files; if so, in whose employ and when and for how long a time?

A. I was. I worked for Mr. Nicholson about eighteen and a half years. I worked for him before he built any file machines, and was with him at the time he built them. I left him four years ago last April.

Q. 3. Were you familiar with the operation of the Nicholson file-cutting machines as operated at their works?

A. Yes, sir.

Q. 4. Looking at the model ("Defendant's Exhibit Model Nicholson File Machine") you see that the tool post is made and

144 attached so that it can be turned on its vertical axis. Has this capacity any practical value; and, if so, for what purpose is it used?

A. It has, for moving or adjusting the chisel on the file.

Q. 5. In using the machine, when does it become necessary to so adjust the chisel?

A. Every time you grind the chisel or put in a new one, so as to bring it on the right angle.

Q. 6. If the new chisel is perfectly ground do you need to turn the tool post from the position it occupied when the old chisel was taken out?

A. Sometimes, if it don't cover the file, you have to knock it around a little to make it cover the file squarely.

Q. 7. In actual use of the machine what was your experience with reference to the chisels being ground accurately?

A. We would grind them as near as we could and then put them in and adjusted them there with the tool post.

Q. 8. When in process of cutting a file the chisel became slightly worn on one side more than the other, what did you do to make it cover the blank properly?

A. I don't know about its getting worn that way. If it did we took it out and ground it. When it did not cover square it was a little light on one side. I can show you just what we did better than I can tell you. (Witness illustrates with model.) First I bring the presser down on the blank. I then let the chisel down until it touches the blank, and if I see light between the edge of the chisel and the blank at one side—that is, if it don't cover squarely—I take a wrench and tap the tool post around until it covers.

Q. 9. Taking the chisels as they were prepared and put into the machines to be used, were they or not in that establishment, while you were there, so perfectly formed as not to require adjustment by means of turning the tool post, as you have described?

A. Very seldom; might once in awhile.

Q. 10. In setting the chisel into the tool post was it the custom to interpose any packing or not?

145 A. Sometimes, if the chisel was short, a piece of steel or a piece of zinc.

Q. 11. How did the machines work with this packing between the chisel and its seat?

A. It didn't make any difference as I know of. I never knew as it did.

Q. 12. While you were there who ground the chisels?

A. Different ones. Some ground their own chisels. They had a man there to do the grinding at one time. They ground them on an emery wheel and then rigged up a grindstone to grind them on. At first they used to grind them by hand on a grindstone.

Q. 13. After grinding were the chisels lapped?

A. Yes; they were lapped some on a wheel with emery and oil. They used to smooth them up on an oil-stone to take off the wire edge after they were lapped.

Q. 14. Was this last operation with the oil-stone done by machinery or by hand?

A. By hand. The lapping was done by hand. You held the chisel in your finger to hold it onto the lap.

JAMES H. HERVEY.

Deposition of Thomas Sully.

Direct examination by WM. W. DOUGLAS, Esq., of counsel for complainant:

Q. 1. What is your name, age, and occupation and residence?

A. Thomas Sully; fifty-three years of age; reside at Warwick; am now farming.

Q. 2. Have you ever been employed at file-cutting? If so, when, and for whom?

A. I have; for Mr. Nicholson. I can't exactly tell when.
146 In 1865 or 1866 I went there and worked there about seven or eight years. It was at the Nicholson File Works in Providence.

Q. 3. What did you do there?

A. I was chiefly for two or three years there on punching rasps. Then I was cutting flat bastard work; not much mill-work, but chiefly flat bastards and smooth and second-cut work. I mean flat sides, not edges.

Q. 4. Did you have anything to do with the grinding of chisels to be used in cutting the Nicholson file machines? If so, what was the process?

A. When the old tool posts were in there we had to grind by hand. Then they have got a grinding machine there. They have changed the cutters. Now they have got a machine to grind them. After the cutter is ground we take it away from there and put it on the lap and take the grindstone marks out of it. Then we take the edge on the whetstone, put the edge of the cutter on the whetstone, and get it to the thickness we want. Now it is all ready for putting into the machine.

Q. 5. Do you mean that you performed these operations upon the chisel yourself or that that was the way a chisel is prepared for the workman?

A. After it comes from the grindstone the workman does it himself, and I have done it.

Q. 6. Do these operations make the chisel perfect, so that you can put in a new chisel where the old one was taken from and begin cutting with it without any adjustment of the machine?

A. No; I don't believe it could once in a hundred times. It might accidentally be done, but it is not practical that we can do it.

Q. 7. As a matter of fact, after preparing your chisel as perfectly as you could and putting it in place in the machine, what did you do next?

A. We would bring the chisel onto the file blank, then hit
147 the nut on the tool post with the wrench to see whether we had got the right angle or not; if not, we would knock the tool post around and bring it to the right angle. When we got it right, then we would go ahead.

Q. 8. How did you know when you had got the right angle, as you call it?

A. We would grind our presser to the angle. Then we would put the cutter in. Then we would know whether we had got the right angle, or somewhere near.

Q. 9. Look at the model as I have placed it and say whether the cutter is now at the right angle.

A. I can't tell about the angle. The cutter does not cover the

file, and I should have to knock it around. We have a gauge to tell the angle.

Q. 10. I have now turned the tool post carrying the cutter so that the edge of the chisel touches the file blank from side to side, the presser bearing upon the blank and holding the bed steady. Is the machine now adjusted properly for use?

A. Yes, sir.

Q. 11. Does the edge of the cutter strike the blank at the same angle that the presser foot strikes it?

A. It will if it is set right.

Q. 12. When the cutter and the presser are both set at the same angle, if you find that the cutter does not cover squarely what do you do?

A. Knock the tool post and cutter around and bring it to cover the file.

Q. 13. If in doing so you should make a small deviation from the desired angle what would be the result?

A. We should start the machine up and run it. If it was too much out we should have to grind the cutter over again. If it was only out, say, half a tooth we should run it. That is the way we did.

148 Q. 14. How often did you take out and grind the presser in ordinary use?

A. According to the hardness of it. Sometimes we would let it go a day or longer. Then we would take it out and grind it.

Q. 15. How often did you take out and change chisels in ordinary use?

A. We used to let them go as long as they would cut a good file; sometimes two or three files; sometimes half a dozen.

Q. 16. During the cutting of a file did you ever change the tool post by tapping it around to make the chisel cover?

A. Yes, sir.

Q. 17. While the machine was running?

A. Not very often; that don't come.

Q. 18. Have you seen others do it?

A. I have.

Q. 19. In placing the chisel in the slot of the tool post in the Nicholson machine was it or not the custom to introduce packing of any kind between the upper end of the chisel and its seat?

A. Yes, sir. We put a piece of steel in there frequently when the cutter got too short.

Q. 20. How did you shape this piece of steel?

A. Draw-file it to get it even as we could.

Q. 21. Did the machine work as well with the packing there as without?

A. Yes, sir.

Q. 22. How and for what purpose did you use the gauge you have spoken of?

A. To get an angle of forty-five degrees on the over-cut and twenty on the upper. Take the file in one hand and the gauge in the other and compare the cut with the gauge.

Q. 23. Are we to understand that this operation took place while the machine was running, or in setting it up, or when?

A. When we set our presser we put the cutter on there to
149 see whether we have got the right angle with the presser. When we have got the right angle with the presser we get the cutter to cover the file. Then we know we are all right.

Q. 24. Did you do this every time that you put in a new cutter, or only when you set a new presser?

A. When we set a new presser we do this. Then we would gauge it frequently between to see whether our presser had got out of shape or not.

THOMAS SULLY.

Deposition of Daniel C. Gorman.

Direct examination *of* WM. W. DOUGLAS, Esq., of counsel for complainant:

Q. 1. What is your name, age, residence, and occupation?

A. Daniel C. Gorman; twenty-four years of age; reside at Providence, R. I.; am tending bar now.

Q. 2. Have you ever worked at file-cutting; and, if so, where, when, and for how long?

A. I have; at the Nicholson File Co.'s; have worked there twice. I worked there, take it altogether, something like eight years. I think I went there in 1873, and I worked there last for about three weeks from March 16th, 1885.

Q. 3. Are you familiar with the operation of the Nicholson file-cutting machine for cutting the flat sides of bastard files?

A. I have cut flat bastards on the Nicholson machine.

Q. 4. In that machine the tool post can be turned on its axis. What, if any, use is this in operating the machine?

A. The tool post is moved to raise and lower; that is one part of the operation. The other part is to sort of guide the chisel on the file. When the chisel strikes one-sided you can see light under it. The presser is to guide the file itself—to hold the bed
150 and file solid—and the chisel is to be set by the presser. When the presser is down on the file we knock the tool post around until we can't see any light under it, so that the chisel will cut even.

Q. 5. What do you mean by "even?"

A. What is cut as heavy on the one side as the other—a perfect file.

Q. 6. When you turn the tool post and chisel around does that not make the cut at a different angle on the file?

A. Certainly it does.

Q. 7. Does a slight deviation from the angle make any difference to the goodness of the work?

A. Suppose I should start in the morning with a long angle and through the course of the day take out my presser and grind it with a shorter angle, if I should grind it at a shorter angle and cut by that both work would go in with the one day's work and both pass.

Q. 8. When a chisel was taken out of a machine because it was dull what was the process used to prepare it for service again?

A. They have got a grinding machine there. Sometimes we would go to that if a piece was broken out of it to save us the trouble of the emery wheel. Of course you would have to use the emery wheel or lap wheel and whetstone afterwards. The workmen generally used the lap wheel themselves by hand. The whetstone was used to take the wire edge off and to rub the face of it down a little, not to have it too sharp.

Q. 9. Then, having put the chisel into the tool post, did you proceed to cut or was there adjustment necessary?

A. I had to set the chisel over again—that is, to get a true cut. Sometimes you put packing on top of the chisel and knock the tool post around to get an even cut—that is, a level cut on the file—from the same blow. The packing is put in to make up for the shortening of the chisel. We made the packing ourselves; sometimes of steel; sometimes of zinc.

DANIEL C. GORMAN.

151 Direct examination by WM. W. DOUGLAS, Esq., of counsel for complainant:

Q. 1. What is your name, age, residence, and occupation?

A. Owen F. Gorman; nineteen years of age; reside at Providence, R. I.; have been a file-cutter; have no occupation at present.

Q. 2. Where did you work at file-cutting and when?

A. I worked at Nicholson File Co.'s for about two years. I left there about a year ago.

Q. 3. Did you work on the Nicholson machine for cutting the sides of files?

A. I did.

Q. 4. In the Nicholson machine can you turn the tool post on its axis?

A. You can, but you can tighten the nut so you can't turn it.

Q. 5. In operating the machine did you turn the tool post and chisel; and, if so, what for?

A. In cutting the file, if it was one-sided, I would take and knock the tool post around.

Q. 6. What do you mean by its being one-sided?

A. When it would cut heavier on one side of the file than on the other.

Q. 7. As a matter of fact, when the chisel was ground and lapped and finished on the whetstone and put in in the place of a chisel that had been used, did the new chisel ever cut deeper on one side of the blank than the other, in your experience?

A. It did.

Q. 8. How often?

A. Nine out of ten times. It was very seldom it would cut straight.

152 Q. 9. And then how did you correct the error?

A. If it were only slightly out of the way we would take a wrench or hammer and knock the tool post around.

Q. 10. How did other workmen do in such a case running on similar machines?

A. I always saw them doing the same thing, knock it around. That is the way I was learned to cut them by my brother and by the foreman, Mr. James Nicholson.

OWEN F. GORMAN.

153 *Evidence for Defendant in Rebuttal.*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Wilmarth H. Thurston, special examiner.

PROVIDENCE, *February 12th*, 1886.

Present: Wm. W. Douglas, of counsel for complainant, and Benj. F. Thurston, of counsel for defendant.

Deposition of Henry B. Renwick.

Direct examination by Mr. THURSTON:

Int. 1. Have you read the deposition of Edward E. Quimby, given in this case on the 3d of June, 1885?

Ans. 1. I have; several times.

Int. 2. The impression left upon my mind from reading Mr. Quimby's answer to interrogatory 5 is that he is in agreement with your statement as to the manner in which the adjustment of the cutter to the guide may be secured and the consequences
154 resulting from such adjustment. If, however, it should be gathered from other parts of his deposition, and particularly from his answer to interrogatory 12, that the fact that the cutter in the Nicholson machine has a cylindrical shank and is mounted in a hollow cylindrical socket, so that it can be rotated on its vertical axis is an embodiment of the invention recited in the third claim of the Bernot patent, are you in agreement with him? In answering this question state whether the devices in the Nicholson machine for enabling the cutter to be adjusted so as to coincide with some line across the face of the file not parallel with the line of the bearing edge of the presser upon the blank constitute a different means for effecting the proper cutting of file teeth from the means of adjusting the bearing edge of the presser into parallelism with the edge of the cutter specified in the Bernot patent and embraced in the 3d claim thereof, on which infringement is charged.

Ans. 2. I am of the opinion that the adjustment of the cutter on a vertical axis in the Nicholson machine is not an embodiment of the invention referred to in the 3d claim of the Bernot patent, and have already given my reasons for that opinion. I will repeat in brief.

Bernot adjusts the presser or guide; Nicholson adjusts the cutter. Bernot adjusts the presser on a horizontal axis; Nicholson adjusts the cutter on a vertical axis. Bernot, when a chisel is ground at an

improper angle, adjusts so that the cutter will cut properly by letting it alone and swinging the presser into parallelism with the chisel; Nicholson, with a chisel imperfect in the same way, causes it to cut with sufficient practical accuracy by twisting the tool or chisel out of parallelism with the presser.

The two machines are adjusted in exactly opposite ways, Nicholson having discovered that he could cut a merchantable file with the presser and the chisel out of parallelism, and that he could adjust a slightly imperfectly ground tool so as to cut a merchantable
155 file by twisting such tool into a position where it was not parallel with the presser. Bernot, as appears from his patent, supposed it was impossible to cut a merchantable file unless the presser and chisel were parallel to each other, and the only possible way of securing this parallelism with an improperly ground tool is by adjusting either the chisel or the presser on a horizontal axis. Nicholson cannot adjust the chisel and presser out of parallelism with each other so as to cut a merchantable file except by the employment of a vertical axis and a vertical axis only. Bernot can adjust into parallelism so as to cut a file with a tool ground at a considerable improper angle. Nicholson can adjust out of parallelism so as to cut a file only when the tool is ground at a slightly improper angle. Bernot can and does, by means of his adjustment of the presser, always cut the tooth at the predetermined angle to the file. Nicholson, by his adjustment of the chisel, always cuts the tooth at an angle different from the proper predetermined angle.

HENRY B. RENWICK.

Attest: WILMARTH H. THURSTON,
Special Examiner.

156 DEFENDANT'S EXHIBIT JOHN CRUM PATENT. W. H. T., Special Ex'r.

Crum's Patent for Improvements in Machinery for Cutting Files, July 1, 1851.

157 THE UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters patent granted John Crum July 1, 1851.

In testimony whereof I, D. P. Holloway, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-ninth day of February, in the year of
[SEAL.] our Lord one thousand eight hundred and sixty-four, and of the Independence of the United States the eighty-eighth.

D. P. HOLLOWAY.

UNITED STATES OF AMERICA:

To all to whom these letters patent shall come:

Whereas John Crum, of Ramapo, N. Y., has alleged that he has invented new and useful improvements in machinery for cutting

No. 383.
The New Amer. File Co.
vs.
The Nicholson File Co.
} p. 159.

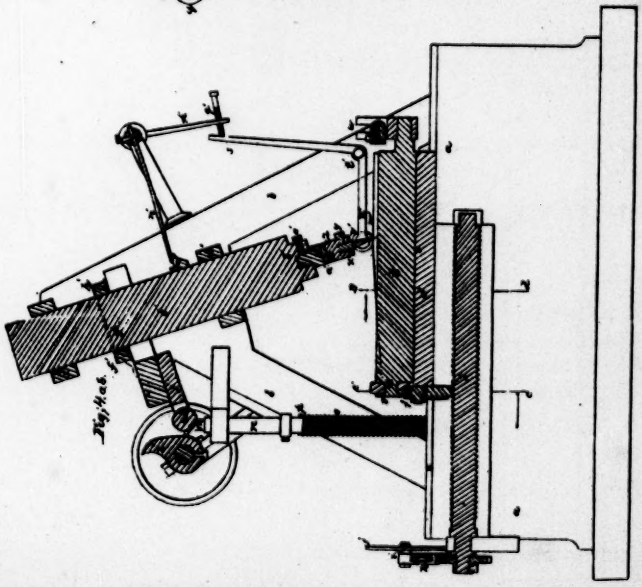
159

Sheet 3 - 3 Sheets.

J. Crum.

File-Cutting Machine

No. 8,199. Patented July 1, 1851.



No. 383.
The New American File Co.
vs.
The Nicholson File Co.
} p. 161

161

Sheet 1-3 Sheets.

J. Crum,

File-Cutting Machine,

No. 8 99.

Patented July 1, 1851.

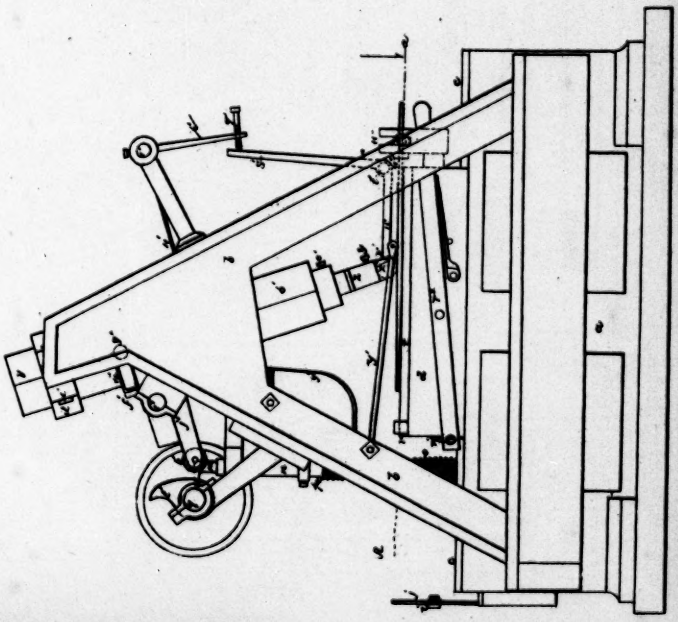


Fig. 1.

No. 383.
The New Amer. File Co. vs. The Nicholson File Co.
} p. 160

160

Sheet 2-3 Sheets

J. Crum,

File-Cutting Machine,

No. 8,199. Patented July 1 1851.

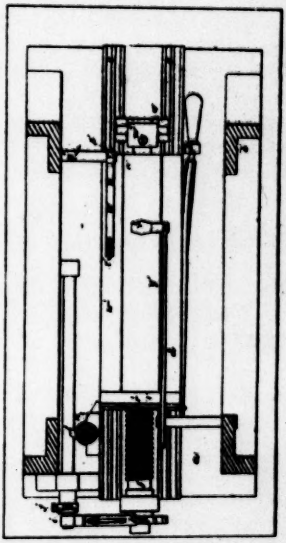


Fig. 1.

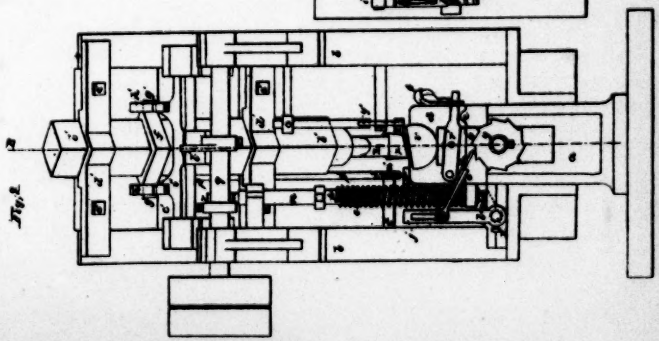


Fig. 2.

files, which he states have not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvements, and that the same have not, to the best of his knowledge and belief, been previously known
158 or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvements and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said John Crum, his heirs, administrators, or assigns, for the term of fourteen years from the first day of July, one thousand eight hundred and fifty-one, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used the said improvements, a description whereof is given in the words of the said Crum in the schedule hereunto annexed and is made part of these presents.

In testimony whereof I have caused these letters to be
[SEAL.] made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this first day of July, in the year of our Lord one thousand eight hundred and fifty-one, and of the Independence of the United States of America the seventy-fifth.

ALEX. H. H. STUART,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.
R. C. WEIGHTMAN,
Acting Commissioner of Patents.

162 *The Schedule Referred to in These Letters Patent and Making Part of the Same.*

To all to whom these presents shall come:

Be it known that I, John Crum, of Ramapo, Rockland county and State of New York, have invented certain new and useful improvements in machinery for cutting files, and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings making part of this specification, in which Fig. 1 is a side elevation of the machine; Fig. 2, a front elevation; Fig. 3, a horizontal section taken at the line *A a* of Fig. 1; Fig. 4, a longitudinal vertical section taken at the line *B b* of Fig. 2; Fig. 5, cross-section of the carriage at *C c*, Fig. 4; Fig. 6, cross-section of the file bed at *D d*, Fig. 4; and Fig. 7, vertical section of the feed motion.

(Here follows diagram marked pp. 159, 160, & 161.)

The same letters indicate like parts in all the figures. Many machines have been invented and essayed for cutting files, but, so far

as I am informed, none prior to my present invention have been practically useful, for the following reasons:

Files are usually made of a form presenting four faces, which are more or less curved, slightly swelling from the handle towards the middle, and decreasing in a more sudden curve towards the point. These curves, as the file passes under the cutter, necessarily vary the range of the cutter's motion in cutting, the motion being greatest where the file is the thinnest and narrowest, so that the force of the blow is greatest where it should be the least. It follows from this state of things that the teeth will be cut deeper towards the
163 point than at or towards the middle. Again, the two ranges of teeth cross each other at given angles to the axis of the file, and the motion of the cutter must be diagonal to the general plane of the face of the file to make the teeth pointing towards the tip or point of the file. These peculiarities in the form of the body and teeth present serious practical difficulties. If the cutting edge be made as it should, at right angles to the plane of its motion, to cut one range of teeth, when reversed by reason of its obliquity, the cutting edge will then be oblique to the face of the file and only touch it at one edge; hence such an arrangement is impracticable. If the cutting edge be made diagonal to the plane of its motion, and reversed for the second range of teeth, then the plane of motion of the cutter will be diagonal, and the force of the blow will be greatest on one side in cutting one range of teeth, and greatest on the other in cutting another range, the result of which must necessarily be an imperfect file; and, finally, the curve of the face and the diagonal range of the lines of the teeth slightly vary the relations of the cutting edges to the plane of the face to be cut as the file moves under the cutter from the point to the handle, and from this it must follow that if the edge of the cutter or the face of the file are not made to shift as the file passes under the cutter, the cuts will vary and the teeth produced be uneven.

All of the above practical difficulties I have avoided by my improvements, which consist—

First. In connecting the file blank to a bed which has a positive feed motion and an incidental rolling motion depending upon the shape of the blank and the angle which the cutter forms therewith.

Second. In connecting the cutter or chisel, or the stock thereof, with the slide, by which the power for cutting the teeth is applied by means of a joint, the axis of which shall be at right angles, or nearly so, with the face of the cutter, when this is combined
164 with a rolling bed on which the blank rests, whereby the cutting edge and face of the blank become mutually self-adapting to the varying angles due to the curved face of the file and the diagonal lines of the teeth.

Third. In holding down the file onto its bed or carriage as it progresses under the cutter by means of a roller which bears thereon just in front of the cutter, whereby that part of the file which is being cut is held firmly down onto the bed, notwithstanding the curvature of the faces, the said roller being made tapering from the middle towards its ends so as to be self-adapting to any change of

position of the face of the file, and the end of the file being held or connected with the bed or carriage by a clamp, or the equivalent thereof, which will permit that end of the file to rise and fall as the file is tilted on its bed by the pressure of the roller.

In the accompanying drawings *a* represents the bed frame of the machine, to which is properly secured the upper-frame work *b*. The top of the bed frame is formed with two ways *c c*, on which runs a carriage, *d*, provided at one end with a block, *e*, that slides vertically in a recess. This block has a semicircular groove which is threaded to fit the threads of a feed screw, *f*, hung in journals between the two ways *c c*, and on the outer end the shaft of the screw is provided with a ratchet wheel, *g*, which is operated by a hand or pawl, *h*, connected by means of a wrist, *i*, that can be adjusted in the slot of an arm, *j*, on a rock shaft, *k*, the said rock shaft having another arm, *l*, to which is jointed the lower end of a vertical rod, *m*, that slides in a tube, *n*, surrounded by a helical spring, *o*. The said spring rests at its lower end on a collar, and its upper end bears against a pin, *p*, that projects from the rod *m* and which slides in slots in the tube, so that the tension of the said spring shall always tend to force up the rod and thus draw back the hand pawl *h*, which at every revolution of the main shaft *q* is pushed forward to turn the ratchet the required distance by the connection of the hand with the arm of the rock shaft, acted upon by a cam, *r*, on the main shaft, which acts on the upper end
165 of the rod *m*, properly formed for that purpose. In this way at each rotation of the main shaft the carriage is moved forward the distance required for the cutting of one tooth. At the end of the feeding motion the carriage is moved back by the attendant, who, for this purpose, must first disengage the block *e* which is secured by a screw passing through a slot to the middle of a short lever, *r'*, connected with a hand lever, *r''*, which runs to the front end of the carriage to be within reach of the attendant.

The cutter or chisel *x* is formed with a stem fitted and secured by a temper screw, *y*, in the socket of the lower half of a stock, *z*, which is jointed to the upper half by a screw bolt, *a'*. The two halves of this stock are put together in the manner of the well-known rule joint, so that the chisel or cutter shall have sufficient lateral play to adapt itself to the varying plane of the surface of the file. The upper end of the stock is fitted by a stem in a socket at the lower end of a heavy block of metal, *b'*, called a slide, and there secured by a temper screw, *c'*. The slide *b'* is a quadrangular prism of the requisite weight, which slides in two cross-bars *d' d'* of the frame, each made in two parts, connected together by screw bolts *e' e'* that they may be adjusted to the slide. The position of the slide is in a plane perpendicular to the transverse plane of the carriage which carries the blank and inclined back from a line perpendicular to the longitudinal plane of said carriage, so as to give the inclined cut required to make the teeth of the file sharp towards the point of the file. At about the middle of its length the slide is provided with a strap, *f'*, properly secured to it, which strap has two trunnions *g' g'* on opposite sides which play in the slots of two arms *h' h* of a rock shaft,

i', which has its bearings in the upper frame b, and which is provided with another arm, j', which at its outer end carries a roller, k', that is forced down to lift the slide and its cutter or chisel by means of a cam, l', or the main shaft q.

166 The cam l, which operates the slide, has a greater sweep than and begins to lift the cutter before the cam r begins to operate the feed motion; but so soon as the feed motion is completed the cam l' liberates the rock shaft to permit the slide and chisel to descend and cut a tooth. As the rock shaft is operated to lift the slide, a projecting piece, m', is brought in contact with a spring, n', attached to a rock shaft, o', from which projects an arm, p', provided with a set-screw, q', the point of which comes in contact with and is arrested by an arm, s', of a rock shaft, t', which has another arm, u', that carries a roller, v', that runs on a plane, w', attached to and carried by the carriage d. After the arm p' of the rock shaft o' has been arrested, the continued upward motion of the slides gives tension to the spring, the recoil of which aids in forcing down the slide to make the cut; hence the point at which the rock shaft o' is arrested will determine the force with which the blow will be struck. The general force of blows for the various kinds of files is regulated by the set-screw q, but the variation of this force for any one file is regulated by the plane, w', on which the roller v runs. The lower the plane the less tension the spring will receive, and hence the less will be the force of the blow, and *vice versa*. In this way the form of the plane w' can be modified to suit the form of file to be cut, that the force of the blow for cutting the teeth may be proportioned to the varying breadth of the file, and also to the varying distance of the surface of the file from the highest point of elevation of the cutting edge.

The line of the cutting edge of the cutter or chisel is diagonal to the line of motion of the carriage to correspond with the lines of one range of teeth, and, when shifted and reversed, corresponding with the lines of the second range of teeth.

The upper surface of the carriage is formed with a semi-cylindrical cavity, s, to which is fitted the under surface of the bed t, so that it can roll therein, the form of the upper face of the said bed being adapted to receive the file blank to be cut. The one end of

167 the bed is formed with a journal, u, properly fitted to the end of the cavity in the carriage, and the journal is provided with a shoulder, v, on the end to prevent the bed from moving endwise in the carriage, and the other end of the bed is provided with poppet heads or standards, w, between which slide the journals of a clamp block, w'', to which is secured the stem of the blank or file to be cut, so that the said clamp will be free to move therein. A brass roller, x', tapered from the middle towards the ends, is fitted to turn on the end of a spring arm, y', and is so situated as to make pressure on the face of the file blank in front of the cutter or chisel, so as to hold it down steadily. Either the journal on which this roller turns should be the largest in the middle, or the hole in the roller should be enlarged from the middle towards each end, so as to avoid as

much as possible all obstruction to the motion of the bed when the lateral inclination of the bed is shifted from the one side to the other.

When cutting the first range of teeth the cutter and the bed are in the position represented in the drawings, and, after the carriage has been run back the cutter is shifted around so as to make its cutting edge cross the line of the first range of teeth, and, as this varies the line of the cutting edge relatively to the face of the file blank, the bed must be turned to shift the inclination of the face of the file blank; but as the bed is free to roll, the first action of the cutter will effect the shifting of the bed if the attendant should neglect to do it.

From the foregoing it will be seen that the cutter for cutting both ranges of teeth has its cutting edge at right angles to its line of motion, and will at each cut strike equally across the whole breadth of the file with equal force, and that the force of the blow can be regulated by varying the form of the curved guide plane so as to adapt the force of the blow relatively to the form of the file, so that the force shall correspond with the resistance, and, finally, by reason of the jointed connection of the cutter stock with the slide which operates it, the edge of the cutter will be rendered self-
168 adapting to any slight variation in the surface of the file blank.

It will be seen from the foregoing that the file blank, during the operation of the machine, rests on and moves under the cutter with the rolling bed, which is longitudinally connected with and operated by the carriage, and adapted to roll therein transversely to adapt the plane of the file to the line of the cutter edge; and as the clamp to which is secured the stem of the file blank is free to move up and down in its connections with the bed, the roller which makes pressure on the face of the blank just in front of the cutter will always keep it firmly onto the bed at that part of its length on which the cutter may be acting, and this, too, without reference to the degree of curvature of the face of the file blank.

What I claim as my invention and desire to secure by letters patent is connecting the file blank to be cut with a bed which has a positive feed motion, substantially as described, in combination with an incidental rolling motion depending upon the shape of the blank and the angle which the cutter forms therewith, substantially as described.

I also claim connecting the chisel with its stock by a joint, as described, in combination with a rolling bed, as described, by which they are rendered self-adapting, as described.

I also claim holding the file down onto the bed during the operation of cutting, and near to the cutter, by means of a roller or its equivalent, combined with the rolling bed, substantially as herein described; but this I only claim when the end of the file is so connected with its bed that it shall be free to move up and down, that the pressure of the roller may keep that part of the file that is being cut firmly down onto the bed as herein specified.

I am aware that before the date of my invention the cutter of file-cutting machines has been jointed to a helve or bar; but in such

cases it has not been combined with a rolling bed, and there-
169 fore I do not wish to be understood as claiming broadly the making of the cutter with a joint, but to claim this only under the limitations pointed out above.

I am also aware that the file blank has been made to slide, during the feeding motion, over a rolling bed, to adapt the transverse plane of the file blank to the line of the cutting edge for cutting the different ranges of teeth, and therefore I do not wish to be understood as claiming broadly the employment of a rolling bed, but to claim such rolling bed when made to move with the file, during the feed motion, from end to end, under the limitations above specified.

JOHN CRUM.

Witnesses:
ROB'T DAVIS.
CAUSTEN BROWNE.

170 DEFENDANT'S EXHIBIT MILLER & DECKER PATENT. W. H. T., Spec. Ex.

CHAS. MILLER & THOMPSON W. DECKER, of New York, ass'ors to Thompson W. Decker.

Letters Patent No. 23645, dated Ap'l 12, 1859.

Imp'd Machine for Cutting Files.

To all whom it may concern:

Be it known that we, Charles Miller and Thompson W. Decker, both of the city, county, and State of New York, have invented certain new and useful improvements in machinery for cutting files; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Fig. 1 is a central longitudinal vertical section of a file-cutting machine with our improvements.

Fig. 2 is a transverse vertical section of the same.

172 Similar letters of reference indicate like parts in both figures.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation.

(Here follows diagram marked p. 171.)

A is a bed-plate which supports all the working parts of the machine. B is a carriage fitted to slide on the said bed-plate, and having fitted to it a rolling or rocking bed, C, such as is common to many file-cutting machines, for carrying the file blank *a* during the cutting operation. *b c* are clamps, and *d* a screw for operating the clamp *c*, to secure the file blank to the bed C. D is a feed-screw for giving the necessary movement to the carriage B to feed the file blank under the chisel to make the cuts at proper distances, the said

171

Miller & Decker.

File Cutting Machine.

No. 23,645. Patented Apr. 12, 1859.

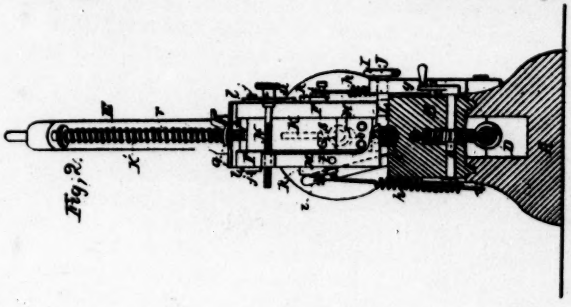


Fig. 2.

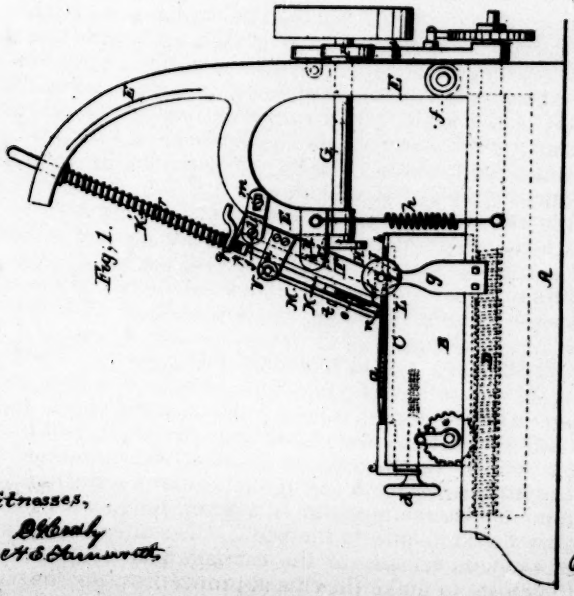


Fig. 1.

No. 383.
The New Amer.
File Co.
&
The Nicholson
File Co.
} v. 171

Witnesses,
O. Keasby
H. C. Hammatt.

Inventors,
A. Miller
Thompson Decker

screw having journals at its ends working in bearing- in the ends of the bed-plate, and its thread working in a gear, *e*, whose journals are fitted to turn in bearings in the carriage. The said gear *e* is locked that it may operate as a nut in connection with the screw to
173 feed the carriage forward, and is unlocked to be operated as a pinion in combination with the screw as a fixed rack to run the carriage back quickly.

E is the frame which contains the chisel stock F and all its appendages and the driving shaft G, said frame being hinged at *f* to the back end of the bed-plate A, so as to provide for the raising of the chisel stock and chisel and all their appendages by means of a cam, L, arranged below the chisel stock, the said cam being fast upon a short shaft, I, which is arranged in a bearing in the standard *g*, and which is furnished with a hand wheel or handle, J, at the side of the machine. The chisel stock is held down when in operation by means of two strong springs *h h*, connecting the front portion of the frame E close behind the chisel stock with the bed-plate A. The chisel stock F, which has the chisel-holder K fitted to slide freely up and down within it, is secured rigidly to
174 the front of the frame E partly by two screw bolts *i i*, which pass through two cheek pieces *k k*, cast in the frame E, and screw into the sides of said stock, and partly by two plates *l l*, which are bolted to the sides of said stock by screw bolts *j*, and to the frame E by screw bolts *m*. The chisel-holder K, having the chisel *n* attached by means of a screw clamp, *o*, has a long stem, K′, which passes through a guide in the top of the frame E, the lower part of which stem has a screw-thread cut upon it and passes through an opening in a plate or flange, *p*, bolted to or cast on the top of stock F, and above the plate or flange *p* the screw-thread on said stem is fitted with a nut, *q*, to which the plate or flange *p* constitutes a stop for the purpose of preventing the chisel descending beyond a certain depth below the bottom of the stock F and making a cut beyond a certain depth when driven down by a spring, *r*, which
175 is coiled round the stem K′ between the nut *q* and the top of the frame E. The holder K has projecting from its back side an arm, *s*, which is operated upon to lift the chisel-holder and then to leave it suddenly to the action of the spring *r* by means of a cam, H, on the driving shaft G, the spring producing the sudden descent of the chisel, which effects the cut. The driving shaft G is driven by a belt running on its pulley G′, and it carries a cam, P, which operates the feed-screw D by means of a ratchet motion.

The chisel stock F is intended to rest upon the file blank during the cutting operation, and thus, by aid of the stop nut *q* on the stem of the chisel-holder, to produce a uniform depth of cut all along the face of the file blank, whatever its profile. This method of regulating the depth of cut is the same as that described in the letters patent of Charles Miller, dated Nov'r 11th, 1856; but, instead of letting the chisel stock itself rest directly on the face of the file blank, as described in the before-mentioned letters patent, we attach to the said stock, for the purpose of supporting it on
176 the said face, what we term the gauge rest M, the effect of

which in regulating the depth of cut in the successive operations of the chisel is the same as though the chisel stock rested directly upon the file blank, with the advantage that the said gauge rest constitutes, in combination with the rolling bed C, a means of so adjusting the file blank to the edge of the chisel as to produce a uniform depth of cut all across or at both edges of either face of the file. The gauge-rest M consists of a bent lever secured to the chisel stock by a fulcrum pin, *t*, upon which it oscillates and having its bottom formed with a straight-edged foot-like piece which rests upon the face of the file blank. In the upper end of the said gauge rest M there is cut a female screw-thread to receive a screw, N, which is so fitted to a bearing, *u*, attached to the stock F, as to be permitted a longitudinal movement, but to be capable of being turned freely by hand to set the straight bottom edge of the foot of the gauge rest parallel with the edge of the chisel. The gauge rest, being thus set and bearing upon the file blank with the full
177 force due to the tension of the springs *h h*, causes the rolling bed so to adapt its position as always to keep the face of the file blank parallel with the face of the chisel, and thus insure the same depth of cut all across the said face. The adjustment of the blank by means of the gauge rest can be effected by turning the screw N while the machine is in operation, if it should be found that the chisel is cutting deeper towards either edge of the face.

In all other machines with which we are acquainted whenever the chisel fails to cut evenly it is necessary to remove the chisel and grind down its edge so that it will cut straight; this frequently has to be done very often, especially if the attendant happens to be so unlucky as to put on an untrue edge in the first setting or sharpening of the chisel, for there is no way of adjusting the bed and blank to the cutter while the machine is in operation; but the machine must be stopped and the cutter taken out and adjusted by grinding to suit the bed and blank. By arranging the
178 gauge rest M to oscillate as we have described the bed and blank are adjusted at any moment desired without stopping the machine. If the attendant observes that the chisel is cutting unevenly he has only to oscillate the rest M by turning the screw N, which will cause the foot of the rest to bear upon the desired side of the blank and bring it into line with the cutter.

By arranging the rest to oscillate we are also enabled to produce better work, because we can adjust the cutter to operate with more nicety upon all the work than it is possible to do under the method of adjusting pertaining to other machines as mentioned.

The hinging of the frame E to the bed-plate at *f* permits the gauge rest M to follow the curve of the face of the file and thus cause the chisel, which is always arrested by the stop *p*, to produce a uniform depth of cut from end to end of the file, besides affording the greatest convenience for raising the chisel stock to permit the carriage to be run back and to permit the removal of the chisel.

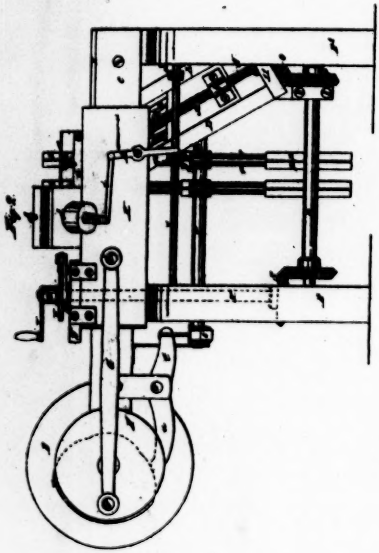
182

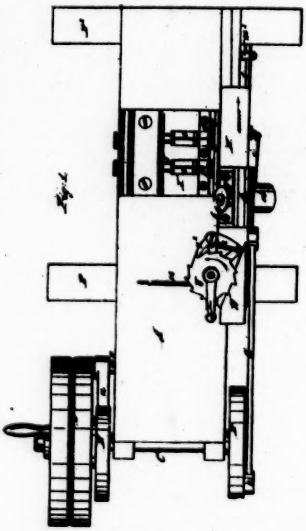
No. 383.
The New Amer. File Co.
The Nicholson File Co
p. 182

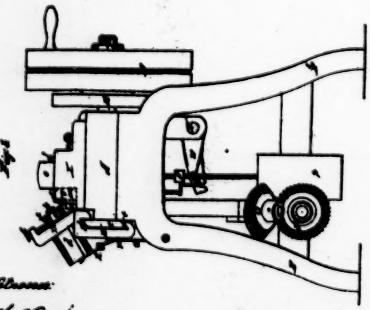
M. D. Whipple,

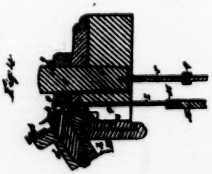
File-Cutting Machine.

No 22,812. Patented Feb. 1, 1859.









Witnesses:

Inventor:
Milton D. Whipple

179 The angle of the chisel is changed relatively to the face of the file blank by slacking the screw bolts *i* and *m* on each side of the machine. The latter bolts pass through slots in the plate *l*, as shown in Fig. 1, and these slots when said bolts are slackened permit the chisel stock F to swing a limited distance on the two screws *i i*. When the chisel is adjusted by swinging the stock back or forth the bolts are tightened up again and the machine is again in working order.

Having thus described our invention, we claim and desire to secure by letters patent—

1st. Arranging the gauge rest M to oscillate upon a fulcrum (*t*) located in relation to the cutting chisel substantially as shown, so that by moving the arm of said rest laterally by means of the screw N the bed C and blank (*a*) may be adjusted to correspond with the cutting edge of the chisel, as herein set forth.

2nd. Hinging the frame E, which carries the chisel and its appurtenances, to the frame A by a joint at (*f*), so that the rest M
180 may readily follow the curve of the file blank and with the chisel be thrown back when desired, all as herein shown and described.

CHARLES MILLER.
THOMPSON W. DECKER.

Witnesses:
D. G. CROSBY.
H. E. FARNSWORTH.

Ex'd: E. A. M.; H. M. H.

[Endorsed:] 19525 D.

181 DEFENDANT'S EXHIBIT MILTON D. WHIPPLE PATENT. W. H. T., Spec. Ex'r.

MILTON D. WHIPPLE, of Charlestown, Mass., asso'r to the Whipple File Company.

Letters Patent No. 22842, dated Feb. 1, 1859.

Imp't in Machines for Cutting Files.

To all whom it may concern:

Be it known that I, Milton D. Whipple, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented a new and improved machine for cutting files, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of the specification, in which—

(Here follows diagram marked p. 182.)

Fig. 1 is a plan of the machine, Fig. 2 a side elevation, and Fig. 3 an end elevation of the same; Fig. 4, vertical section through one

of the clamping wedges, the file blank, and the chisel, on the line $x\ x$ of Fig. 1.

Within the past century repeated attempts have been made to cut files by machinery, but, so far as I am informed, in no instance has the construction and operation of any machine been made public that was capable of performing its work satisfactorily or of producing files that could favorably compare with those made by hand. Amongst the difficulties which have thus far proved to be insurmountable in the cutting of files by machinery may be in-
183 stanced the following:

Firstly. The steel of which the files are manufactured is not of uniform structure or hardness, and there occur soft and hard places in the blanks, and where the chisel was operated by a uniform pressure or by uniform blows of a hammer it was not found possible to give a uniformly roughened surface to the file, as the indentations upon the soft places were much deeper than those upon the hard spots, and a corresponding irregularity of tooth was the result.

2d. A large class of files are wider from the tang to the center than at their extreme end, and it is obvious that a given force, whether of pressure or impact, that will make the required indenture at the widest part of the file will sink the chisel too deep at the narrower part near the end. Efforts have been made to counteract this difficulty, but thus far without success, by causing the force of the blow to diminish by diminishing gradually the distance through which the hammer falls as the work proceeds from the widest to the narrowest part of the file.

3rd. Most files taper in thickness as well as in width, and a further allowance or adjustment is required to prevent the ham-
184 mer from falling through a greater distance when operating upon the thin than on the thick part of the blank.

4th. As the workman, when cutting files by hand, adjusts his chisel preparatory to each cut by drawing it back against the burr which constitutes the last tooth made the leather straps which he employs to hold the blank are sufficient for the purpose. With machine work, however, it is different, for while it is necessary that the file have a comparatively soft bed on which to rest for the protection of the teeth whilst the 2d side is being cut it is equally necessary that this bed be unyielding; otherwise the action of the hammer and chisel upon its surface will vary at different points; and in conjunction with the above requirement there is another still more rigid, that the blank be held firmly and immovably that it may be accurately fed between the successive cuts. These conflicting exigencies have placed further difficulties in the path of those who have attempted to cut files by machinery. In the machines heretofore contrived for making files the side of the blank opposite to that being cut has rested upon an unyielding bed and, as the chisel is held rigidly, if the blank at any part of its length be thicker upon one edge than upon the other the file will be imperfect at
185 that point, owing to the irregular depth of the cut, and it is not found practical without too great an expenditure of labor to forge the blanks so accurately that the opposite sides of their

cross-sections shall always be parallel. The above difficulties have all been removed by my present invention, which consists—

Firstly. In the employment of a circular chisel, which in lieu of being brought up to the blank and forced into its surface by pressure or by the blow of a hammer is allowed to roll over it, it being so adjusted to the surface of the blank that it shall sink a given distance into it, whether it be more or less wide, for it is obvious that the depth of the cut made or the height of burr raised by the tool will not be influenced by the varying width of surface that it is called to act upon. It is also evident, if the blank be held rigidly unyielding, that the depth to which this cutter will sink into the blank will not be influenced by the greater or less hardness of the material at different points if it be caused to traverse in a rigidly unyielding plane.

Secondly. My invention consists in holding that face of the blank which is being cut up against a face plate or rest by pressure upon its opposite side, whereby the position of the side being cut is determined with respect to the cutter, and not that of the side opposite to the one being cut, as has heretofore been the case. I thus ensure uniformity of cut upon each face of the blank, notwithstanding any difference of thickness that may exist upon the opposite edges or any varying thickness of the blank from end to end; and my invention consists, thirdly, in clamping the blank rigidly while a cut is being made and releasing it preparatory to its being fed, whereby I am enabled to hold it with any required degree of rigidity and to feed it with the utmost accuracy; and my invention consists, fourthly, in a certain device for holding the blanks while a cut is being made, which will be more particularly described hereafter; and my invention consists, fifthly, in a machine for cutting files, consisting essentially of the organization of the above features and so constructed and arranged as to cut files, as will now be more fully set forth and described.

186

In the drawing, A is a bed or table supported upon legs B B^2. In suitable bearings at one end of this bed is carried a shaft, C, to which is attached the driving pulleys D, a cam, E, and a disk, F. To the latter is pivoted at *a* the connecting rod G, the other end of which is pivoted at *b* to a sliding carriage, H. This carriage is supported on a way, *c*, which lies horizontally along the side of the bed A, and is secured thereto, the beveled edges 2 3 of the way fitting into corresponding grooves in the carriage, as shown in Figs. 3 and 4. The revolutions of the shaft C impart to the carriage H a horizontal reciprocating motion. To the top of the carriage H is secured a block, *d*, which serves to carry a short shaft, *e*, inclined at an angle of about 45 degrees to the face of the bed A. To this shaft, upon its inner end, is secured the cutter *f*, which consists of a circular disk of tempered steel having a bevelled edge, which disk is fastened eccentrically upon the end of the shaft by a screw, 4, which passes through the disk into the end of the shaft. A plate, *g*, attached to the block *d* by screws and slots 5, serves as the inner bearing of the shaft *e*. This plate is adjusted in position by means of the set-screw 6, and thus the cutter is raised or lowered to vary the depth of the cut. To

187

the outer end of the shaft *e* is secured a short arm, *h*, connected by a rod, *i*, to a lever, K, pivoted at 7 to the side of the carriage H. A rod, *l*, supported in the legs B B^2, carries two adjustable collars or stops *m* m^2, against which the lower end of the lever *k* strikes
188 as the carriage H is traversed back and forth, by which means the shaft *e* is caused to make a partial revolution, and the cutter *f*, which, as before stated, is hung without the centre of the shaft *e*, is brought down to make the cut in the blank as the carriage moves in one direction, and is raised up out of the way as the carriage returns that it may not mar the cut just made.

The manner in which the blank is held whilst the cut is being made and then released and fed up will now be explained. I may here state that the machine which is represented in the accompanying drawings is arranged to cut two files at the same time, but as many may be arranged in front of the cutter *f* as is found convenient or the traverse of the carriage H will admit of. A stout block, I, on top of the bed A has secured to its front edge next to the cutter *f* a face plate, *n*, back of which, in a suitably inclined slot, is placed the file blank *q*, the face of the blank which is to be cut being in contact with and being pressed against the face plate in the following manner: In a suitable slot cut vertically down through the block L and bed A are placed two heavy wedges *o*, which, in addition to their own weight, are held down by weights, *p*, suspended from them by rods, *r*. Pins, 8, in the back of the wedges prevent
189 them from falling too low or binding in their sockets. These wedges are raised at proper intervals to allow the blank to be fed up in the following manner: A shaft, K, carried in suitable hangers from the underside of the bed A has attached to it near one end a lever, 8, connected with levers *t* and *u* upon a short shaft, *v*, the lever *u* resting in contact with the cam E on the driving shaft C, so that as the cam is revolved the shaft K is rocked, and a tappet, *w*, on this shaft strikes the tops *q* on the rods *r* and raises the wedges *o*. A plate, *x*, is secured to the top of the block L in front of the wedges *o*. Beneath this plate, in a suitable slot, are inserted two small blocks, 10, of metal (partly dotted in Figs. 1 and 2 and in section in Fig. 4), which bear one against the front edge of each wedge, *o*, and against a shield, *z*, on the rear side of the file blank, so that the face which is being cut is pressed against the face plate *n*. I use two blocks, 10, and two wedges, *o*, to each blank, and when the blank is wide they press more equally against both edges of it.

I will now describe the part of the machine by which the file blank is fed up at intervals after each cut has been made. A frame,
L, is secured in an inclined position (to suit the inclination
190 given to the cuts upon the blank) beneath the bed A (Fig. 2). Between the sides of this frame slides a block, M, on the front of which is secured a nut, *y*, in which turns a screw, N, having its bearings in the lower cross-piece 11 of the frame L. A bevelled gear, O, on the end of this screw shaft engages with a gear, P, on a horizontal shaft, Q, which carries another bevelled gear, R, that engages with a gear, S, on a vertical shaft, T (dotted in Fig. 2). The shafts Q and T are supported in suitable bearings in the frame-work

of the machine. The latter extends up through the bed A and carries on its upper end a ratchet wheel, V, the teeth of which are of a proper size to give the required feed. A dog, Z^2, held in contact with the wheel V by the springs 12 and 13, is struck by the incline W attached to the carriage H each time the carriage is drawn back in the direction of its arrow. This moves the ratchet wheel V one notch in the direction of its arrow, and through the shafts T and Q and their gears turn the screw N and force up the block M the required distance, the end of the file blank resting on top of this block, as shown in Fig. 2. It should be observed that the wedges *o* are raised so as to free the blanks before the feed of the block
191 M takes place. A handle, X, attached to the top of the shaft T, serves to turn back the screw N and lower the block M when a fresh blank is to be placed in the machine, the dog Z^2 being held out of the way by the operator. The blocks 10, on the side which rests against the wedge *o*, are rounded, as shown in Fig. 4, so that they may always have a proper bearing with the front or flat sides on the shield Z, behind the file blank (or a jointed block or shoe may be used). The shield or guard Z is a strip of soft metal or of steel plated with soft metal, which is secured to the top of the block M at 15 (Fig. 4), behind the blank *q* and is fed up with the blank. It is placed in the same slot with the blank and between it and the blocks 10. This prevents the face of the file which has been cut from being bruised by the blocks 10 or adhering to them whilst the second side of the file is being cut. The edge of the blank generally rests against the side of the slot in which it is placed. If, however, it is desired to keep the blank more exactly central in the slot as it is fed up, and thus prevent any slight variation of the angle of the cuts made in it, the blank near its upper end may rest against a pin inserted in the shield Z, or the edge of the shield may be turned up a little for it to rest against. The face
192 plate *n* is slightly bevelled on the side next to the blank, so that its upper edge only is in contact with the face of the blank immediately below the point at which the cut is made, thus holding the blank firmly in the immediate vicinity of the cut. The cutter *f*, as before stated, is secured to the end of the short shaft *e* by a screw, 4, passing through the center of the disk. This allows the disk or cutter to revolve freely around its center and to roll along over the surface of the blank as it makes each cut, a fresh portion of the edge of the cutter being brought into use by the revolution of the disk. The face of the blank which is being cut resting against the face plate *w*, the depth of the cut made by the revolving disk or cutter may easily be regulated without reference to the width or thickness of the blank.

Operation.

The following is the operation of this machine: The block M is lowered and the blank *q* (with the shield *z* behind it) is placed in its respective slot in the front of the block I, with its lower end resting on the top of the block M and its face, which is about to be cut, bearing against the face plate *w*. The wedges *o*, having been previously

raised to allow the introduction of the blank, are now dropped into place. This binds the blank firmly against the face plate.

193 As the shaft C is revolved the carriage H is traversed back and forth on its ways. Starting from the position shown in the drawings, the carriage H is moved in the direction of its arrow; the cutter *f* is held up out of the way of the blank; the incline W operates the dog *z* and ratchet V and revolves the shafts T and Q and screw N, moving up the block M and blanks resting on it the required distance. Immediately before this takes place the cam E, through the levers *u*, *t*, and *s*, rocks the shaft K and raises the wedges *o*, so that the blank is released to allow it to be fed up. When the carriage reaches the end of its traverse in this direction the lever *k* on the side of it strikes the stop m^2, and the short shaft *e* in the block *d* is revolved sufficiently to bring the cutter *f* down, so that its lower edge will cut into the blank as the carriage returns. Before the carriage commences to move in the opposite direction to make the cut the shaft K is rocked in the opposite direction, and the wedges *o* are lowered into place to hold the blank. The operation is then repeated until the cutting is completed.

194 Claims.

What I claim as my invention, and desire to secure by letters patent, is the circular rolling cutter *f*, operating in the manner substantially as set forth.

2dly. I claim holding the face of the blank which is being cut up to a face plate or rest by pressure upon its opposite side for the purpose specified.

3rd. I claim clamping the blank rigidly while a cut is being made and releasing it preparatory to its being fed, as set forth.

4th. I claim the wedges *o* operating as set forth for the purpose of clamping the blanks as described.

5th. I claim the shield *z*, against which the blank *q* rests and which is fed up with the blank in the manner and for the purpose substantially as set forth.

6th. I claim the within-described machine for cutting files, consisting essentially of the combination of the elements above claimed and operating in the manner substantially as set forth.

MILTON D. WHIPPLE.

Witnesses—

THOS. R. ROACH.
THOS. D. GLOVER.

Ex'd: L. M.; C. F.

195 "DEFENDANT'S EXHIBIT ROSS ENGLISH PATENT." "W. H. T., Spec. Ex."

A. D. 1853, No. 545.

Machine for Cutting Files and Forging Metal.

Letters patent to Robert Craib Ross, of Edinburgh, Scotland, for the invention of "an improved machine or instrument for cutting files and forging metal."

Sealed the 27th April, 1853, and dated the 4th March, 1853.

Provisional specification left by the said Robert Craib Ross at the office of the Commissioner of Patents, with his petition, on the 4th March, 1853.

I, Robert Craib Ross, of Edinburgh, Scotland, engineer, do hereby declare the nature of the said invention for "an improved machine or instrument for cutting files and forging metal" to be as follows:

My invention consists in the adaptation and application of a vibrating lever, mounted on a shaft and actuated by a suitably formed cam in such a manner as to cause it to exert the required amount of striking power, the degree of effect produced by the said lever being regulated by means of a lever in connection with a spring contained within a tubular column fixed below the said shaft.

When this machine or instrument is employed for cutting files there is placed below the striking lever a cast-iron block, which moves parallel with the lever, and upon which the file to be cut is fixed and adjusted. Between the block and striking lever is
196 fixed the cutter or teething tool, so arranged as to give the proper angle rise and fall for the operation. Upon this tool the vibrating lever is made to act or strike while the block with the file is moved along (by means of a screw and ratchet motion) by the rise and fall of the counter or driven end of the lever, the movements being so arranged as to be adapted to the required gauge of the teeth of the file.

Any number of such machines or instruments may be ranged along parallel to a driving shaft, with a vertical acting volute cam or other suitably formed cam, in connection with each machine or instrument, with also a spring lever to keep the operations of each machine or instrument distinct.

When the machine or instrument is employed for forging metals the lever above described is made to vibrate by means of a horizontal semi-screw or circular wedge cam, or other suitably formed cam, fixed upon the same standard with the shaft on which the lever is suspended; and an anvil is placed within range of the machine or instrument, which, on being driven by a pulley on the same shaft with the cam, acts upon the metal held on the anvil. The spring lever is placed convenient to the workman at the anvil, so that he

may by means of it regulate the force of the blow given by the striking lever.

Specification in pursuance of the conditions of the letters patent filed by the said Robert Craib Ross in the Great Seal Patent Office on the 3d of September, 1853.

To all to whom these presents shall come I, Robert Craib Ross, of Edinburgh, Scotland, engineer, send greeting:

Whereas her most excellent majesty Queen Victoria, by her letters patent bearing date the fourth day of March, in the year of our Lord one thousand eight hundred and fifty-three, in the sixteenth year of her reign, did, for herself, her heirs, and successors, give and grant unto me, the said Robert Craib Ross, her special license that I, the said Robert Craib Ross, my executors, administrators, and assigns, or such others as I, the said Robert Craib Ross, my executors, administrators, and assigns, should at any time agree
197 with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man an invention for "an improved machine or instrument for cutting files and forging metal," upon the condition (amongst others) that I, the said Robert Craib Ross, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said invention and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said letters patent.

Now, know ye that I, the said Robert Craib Ross, do hereby declare the nature of my said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement, reference being had to the drawings hereunto annexed and to the letters and figures marked thereon (that is to say):

My invention of "an improved machine or instrument for cutting files and forging metal" has for its object the due regulation of the force of the blow imparted by a striking lever by means of a spring so placed as to be capable of being made to act on either side of and at different distances from the point of suspension or fulcrum of the said lever, the force of the spring being counteracted and the lever raised or its gravity overcome by means of a suitably formed cam so as to be in a suitable position to give the required blow when the spring is brought into action for the purpose. The spring itself may be a spiral spring confined within a column or it may be of another form. Two different forms will be hereinafter described, but my invention is not confined to them, the object being to use such a form and arrangement of the spring as shall be best adapted for governing the striking power of the lever by exerting more or less elastic force against the under or upper side of the lever, and with more or less effect according to the situation of the point of action of the said

spring in relation to the point of suspension or fulcrum of the said lever. The spring is intended to have its acting position changed by means of a lever, which may be readily worked for the
198 purpose. The striking lever itself consists of an arm or lever mounted on a shaft or centre of suspension and weighted at the striking end or formed thereat with a hammer head, according to the use to which it is applied.

In order, however, that my invention may be fully understood I will proceed to describe the two applications of it shown in the accompanying drawings, in which figures 1 and 2 refer to the machine or instrument for cutting files and Fig. 3 to that for forging metal.

(Here follow diagrams marked pp. 201 & 202.)

Fig. 1 is a longitudinal elevation and Fig. 2 a front view of the machine or instrument. A A are the upright frame or standards of the machine fixed upon a suitable base or sole plate, B, with strong cast-iron bearers, C C, carried out in front and at right angles to the upright standards. These bearers are fixed to the standards A at one end and likewise solidly supported by the timber block D, resting on the sole plate B. E is the vibrating or striking lever, suspended on the shaft F, suitably mounted in the frame-work of the machine. The striking end of this lever is weighted as shown. At the reverse end G the lever is acted upon by the vertically acting volute cam H, fixed upon the revolving shaft I. The extent of depression of this end of the lever by the cam must be proportioned to the length of the required rise and fall of the opposite or striking end of the lever, and the force of the blow struck by the lever is governed by a spring placed so as to act on the under side of the lever or the side opposed to the action of the cam. The form of the spring may be spiral, and it may be confined within a tubular column, but the spring which I prefer for this purpose is a plate spring, such as is shown at J. This spring is fixed at one end to the standard A, at K, by means of the joint and joint pin L L, the other end being brought to bear with its elastic force on the under side of the lever E. This end of the spring is cup-formed, into which is fitted a ball, M, which is intended to lessen the friction of the spring against the lever when moved along it in order to change the point of action of the spring upon the lever. The spring may be moved to either side of the centre of suspension of the lever by turning the lever N on its fulcrum or centre (which is the joint pin L of the spring) by means of the regulating lever O, having its fulcrum or centre of motion at O*.

Thus the elastic force exerted by the spring upon the lever
199 may be so variously applied as to produce a corresponding variety of effect on the striking power of the lever. It may be so applied as to poise the lever or counteract its power of gravity, and it may also be applied so as greatly to increase the force of the blow, being likewise capable of application to points on the lever between these two extremes, by which a medium of effect may be produced. P is a cast-iron block placed below the striking lever and resting on the bearer C, on which block the file Q is fixed and ad-

justed. R is the tool or instrument by which the teeth are cut upon the file by means of the successive blows of the striking lever while the block P is moved along, carrying with it the file Q. This block is moved backwards or forwards by means of the screw U and ratchet motion S S, actuated by the driven end G of the striking lever, the movements being so arranged as to suit the particular size of teeth to be cut on the file. T is the holder for the tool or instrument R, and is mounted on the shaft F, on which the lever E is suspended. This holder T has a movement imparted to the tail on its upper end by the concentric boss V, on the driving shaft I, which causes the said holder T with the tool R to rise clear of the file while it is moved with the block P for another cut (the springs Y Y again bringing the tool to the face of the file), and thereby gives it the proper angle rise and fall for the operation. The proper angle referred to is the angle of the tool, as shown in the drawing, being in this case the angle required for the particular cut to be given to the file. W is a recess in the block P, filled with lead to act as a sort of pillow for the file while it is being cut. X X are links which, in conjunction with the springs Y Y, serve to keep the tool R fair to its work. Z is a friction roller, which is made to press with more or less force upon the file and block by means of the regulating lever *a* and link *a** in order to steady their movements. When the file to be cut is made tapering to the point the blow from the striking lever should be regulated so as to become gradually heavier and lighter, as may be required, in the proper degrees according to the particular breadth of the file. For this purpose there is fixed a tapering guide at *b* (see Fig. 2), connected with the screw U by the wheels *c c*. This screw, as it receives motion from the ratchet S, imparts it to the tapering guide *b*, which is thus made to force the joint pin at C from the standard A, and thereby to put a strain upon the spring J, and consequently to increase the force of the blow given by the striking lever. The lever E is poised and its action stopped when the tool R arrives at the end of the file by means of a catch fixed on the block P coming in contact with the catch *e*, by which the lever Q is liberated and falls towards *f*, and the spring J brought in front of the center of suspension of the striking lever.

I would here remark that any number of such machines or instruments as have been thus described may be ranged along a driving shaft with a cam on the shaft for each machine, with also a striking lever and spring to each to keep their operations distinct.

I now proceed to describe the application of my invention to forging metal.

Fig. 3 is a vertical section of the machine or instrument for this purpose, consisting essentially, as in the former case, of a striking lever and a controlling spring. In the present instance the machine or instrument is constructed so as to be capable of turning on an upright column A (similar to a gib crane), thereby taking, if required, two or more forging anvils within its range of action. The striking lever (which is broken in the drawing), being used as a hammer, has a suitably formed head for the purpose, and is adjusted so as to give

the blow at the required angle by means of the link B (which is broken in the drawing), jointed to the standard C, at *c*, and to the hammer head of the lever at D. This hammer head is suspended from the lever by a joint at F, but it is so united to the lever by its face block G, bedding closely to it at H, as to transmit the reacting force of the blow to the lever. In the drawing the hammer head is shown to be so connected as to strike vertically, but by shifting the joint of the link B on the standard nearer to or farther from the centre of suspension I the hammer may be made to strike at an angle. The machine or instrument is constructed so as to be either stationary or to turn on the column while striking upon the metal on the anvil.

For the present purpose I prefer to use a controlling spring
203 of the form of a spiral or volute, and confined within the tubular column as at A, on which the machine or instrument turns. By this arrangement the spring L is in a position to exert its elastic force upon the upright shaft N, likewise confined within the column. This shaft N has a cup formed on its upper end into which the ball O fits, so as to lessen the friction against the under side of the striking lever. An oblong slot is cut in this shaft at P, through which the lever Q is passed. By turning this lever (which is broken off in the drawing) the shaft N may be turned and its upper end made to act upon the under side of the striking lever at either side of its centre of suspension (and at different points on the lever in relation thereto) with the like effect and for the purpose described above in reference to the operation of cutting files. R is the cam for acting upon a roller, S, at the end of the lever E, on the opposite side of the centre of suspension to the striking end. This cam revolves horizontally, being driven by the pulleys T, on the upright shaft W, and causes the required depression of the end S, of the lever E, in order to raise the opposite or striking end of the same as required.

It is to be observed that the whole machine is capable of turning by being mounted on the standard C, which may turn upon the column A.

Having thus described the nature of my invention and in what manner the same is to be performed, I would have it understood that I do not mean or intend to confine myself to the precise forms and arrangements of the parts shewn and described, as the same may be varied without departing from the principle of my invention; but what I claim as of my invention is—

First, the adaptation and application to machines for cutting files of the striking lever and controlling spring capable of acting upon various points of the lever in relation to its centre of suspension as described;

And, secondly, the adaptation and application to machines for forging metal of the striking lever and controlling spring capable of acting in like manner and with like effect upon the striking
204 power of the lever, such machines or instruments being adapted to turn while striking as described.

In witness whereof I, the said Robert Craib Ross, have hereunto

set my hand and seal the thirty-first day of August, in the year of our Lord one thousand eight hundred and fifty-three.

ROBERT CRAIB ROSS. [L. S.]

Witness:
DAVID PENNEY.

London: Printed by George Edward Eyre and William Spottiswoode, printers to the Queen's Most Excellent Majesty, 1853.

205 EXHIBIT MILLER 1856 PATENT. J. A. S., Examiner. June 21st, 1883.

CHARLES MILLER, of New York, N. Y.

Letters Patent No. 16064, dated Nov. 11th, 1856.

Imp't in Cutting Files.

To all whom it may concern:

Be it known that I, Charles Miller, of the city, county, and State of New York, have invented a new and useful improvement in machinery for cutting files; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

(Here follows diagram marked p. 205*a*.)

Fig. 1 is a longitudinal vertical section of a file-cutting machine with my improvement.

Fig. 2 is a front elevation of the same.

Similar letters of reference indicate corresponding parts in both fig's.

This invention consists of a certain contrivance for regulating the operation of the chisel for the purpose of producing an uniform depth of cut from end to end of the file.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

206 A is a stationary table containing ways for a horizontal sliding carriage, B. This carriage, B, has a cavity in its upper surface which is to be lined at the bottom with some sufficiently soft metal to serve as a bed to the file blank to rest in during the cutting operation, said cavity or bed being of such length, width, and form as to prevent the file blank moving longitudinally or laterally during the cutting operation. A file blank is represented on the carriage B in both views in red outline. C is an endless screw working in fixed bearings in the end of the table A and fitting to a nut, D, secured under the carriage B for the purpose of moving the carriage to feed the file blank to the chisel.

E is a strong bridge piece striding across and firmly secured to the table A to support the fixed guide F, to which is fitted the chisel

C. Miller.

205-a

File-Cutting Machine

No. 11,064. Patented Nov. 11, 1856

No. 383.
The New Ansonia File Co.
v.
The Nicholson File Co.
h. 205-a

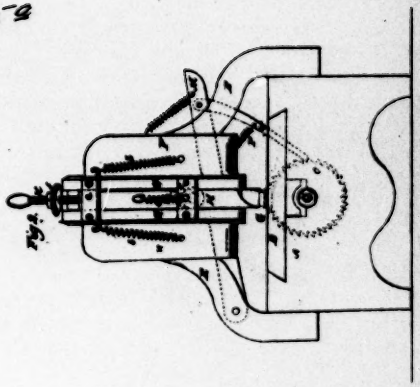
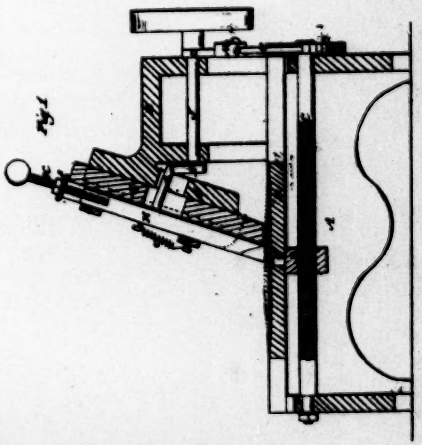


Fig. 1.



stock G, said guide being inclined backwards from the bottom upwards to throw forward the lower end of the chisel. The bottom of the chisel stock is required to rest upon the upper face of the file blank during the cutting operation, and in order to keep it firmly in contact therewith the chisel stock is connected with the guide F by means of two springs, *b b*, which hold it down but at the same time permit it to rise over the curved surface of the file blank as the latter moves longitudinally under it. The bottom part of the stock which rests on the file blank is made narrower than
207 the narrowest file intended to be cut in the machine, so that it may not project beyond the edges of the file blanks. H is the chisel which is fitted to slide up and down in a groove in the front of the stock G, and is confined in its place by two cross-pieces *c c*, secured to the stock. The chisel is moved upwards to prepare to strike the file blank to produce the cutting operation by means of a cam, I, on a rotating shaft, J, which works in bearings in the bridge piece E, said cam operating on the under side of a stud, *d*, which is secured to the back of the chisel and passes through a slot in the back of the stock G. The descent of the chisel to strike the blow is produced, after the point of the cam passes the stud *d*, by the action of a spring, *e*, which connects it with the lower cross-piece *c*. The shaft J carries another cam, I, which operates to depress a lever, M, to which is attached a pawl, N, engaging with a ratchet wheel, O, on the end of the screw C. The depression of the lever M causes the pawl N to give motion to the ratchet wheel, and thus move the screw to produce the feed motion of the carriage. The lever M is raised again after the action of the cam by means of a spring, P. The cams must be arranged so that the feed takes place while the chisel is stationary.

K is a screw screwing directly into the head of the chisel H,
208 and provided with a broad flanged nut or collar, *f*, which, when the chisel strikes its blow, comes in contact with the stock G, which serves as a stop thereto, and thus serves to prevent the further movement of the chisel, and hence regulates the depth of the cut. The depth of cut may be varied by screwing the nut K further into or out from the chisel head, and using a collar at *f* that is moveable on the screw, or by employing a nut at *f* to screw up higher or down lower, and having the screw immovably attached to the chisel head.

It must be observed that the lift of the cam must be sufficient to give the chisel a sufficient amount of fall to cut the required depth on the thickest or highest part of any file. This being the case, it will be readily understood that, as the chisel stock G always rests on the file blank close to the chisel and serves as a stop to the descent of the chisel, the depth of cut must be perfectly uniform from end to end of the file, whatever may be its form in a longitudinal direction. This result is the most difficult of all to obtain in cutting files, and upon its perfection the good quality of the file in a great measure depends.

Instead of having the stock G rest directly upon the file blank, it may rest upon a pattern or patterns of corresponding form at-

tached to the carriage on one or both sides of the file blank.
209 I do not contemplate using any such arrangement, as it is more complicated, less reliable, and altogether inferior to the arrangement of the stock to rest on the file blank itself, but mention it to show that the principle of the invention is capable of modification.

I do not claim the mere employment of a stop to regulate the depth of the cut of the chisel.

But what I claim as my invention and desire to secure by letters patent is—

Fitting the chisel to work in a stock which rests upon the file blank itself or on a pattern of similar form moving *moving* with it throughout the whole length of the movement of the blank under the chisel and serves as a stop to the chisel, substantially as and for the purposes herein described.

CHARLES MILLER.

Witnesses:
W. FUSCH.
JAMES F. BUCKLEY.

Ex'd: J. A. M.; M. McK.

211 DEFENDANT'S EXHIBIT WHIPPLE FILE PATENT, JUNE 20, 1883. J. A. S., Examiner.

MILTON D. WHIPPLE, of Charleston, Mass., ass'or to "The Whipple File Company."

Letters Patent No. 28947, dated June 26, 1860.

Imp't in Manufacture of Files.

To all whom it may concern:

Be it known that I, Milton D. Whipple, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented certain new and useful improvements in files, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

(Here follows diagram marked p. 210.)

Fig. 1 is a view of a file having my improved form of tooth;

Fig. 2, a view of the teeth enlarged.

In flat files, as ordinarily made, it has not been practicable to make every tooth of the same uniform height and with a smooth cutting edge, as either the force of the blow given to the chisel varied or the chisel was sharper at one part of the operation of cutting the file than at another, or the density of the metal of the blank varied at different parts, or, as in some cases, all these causes combined to make the file irregular, so that it could not leave a smooth surface on the article filed with it.

M. D. Whipple,

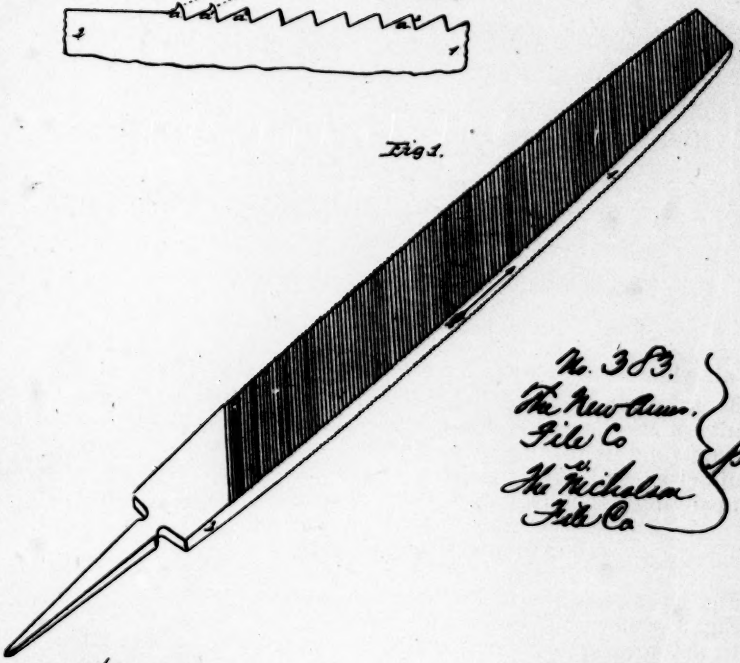
File,

No. 28,947. Patented June 26, 1860.

210

Fig. 2

Fig. 1.



No. 383.
The New Amer. File Co
vs.
The Nicholson File Co

p. 210

Witnesses.
Thos. R. Brach.
P. E. Lockwood

Inventor.
Milton D. Whipple.

Miller & Decker.

Pile Cutting Machine

No. 3,645. Patented Apr. 12, 1859.

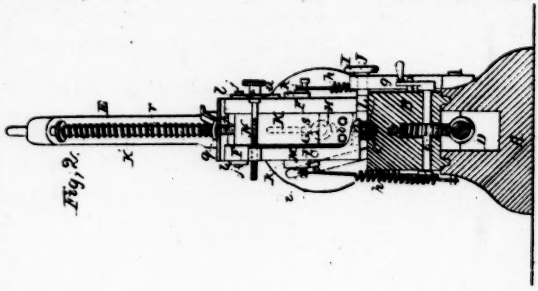


Fig. 2.

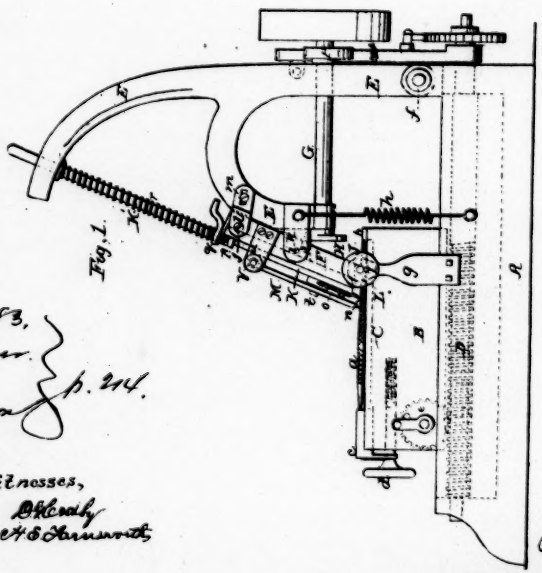


Fig. 1.

No 383,
The Hartmann File
The Nicholson File
p. 214.

Witnesses,
D. Kenealy
H. C. Hanaworth

Inventors,
E. Miller
Thompson W. D.

Epaulet Miller of Keene
File Cutter, June 20. 1853
J. C. T. Epr.

212 These difficulties I have overcome by my present invention, which consists in a flat file, the edges of the teeth of which are sheared off smooth and of an uniform height.

That others skilled in the art may understand and use my invention I will proceed to describe the manner in which I have carried out the same.

The file represented in Fig. 1 is a "flat file" or single-cut file, and is made in the improved file machine, for which I obtained letters patent of the United States February 1st, 1859, in which machine each cut which raises or forms a tooth is made by the circular rolling cutter which passes diagonally across the face of the blank. The cut so made raises the surface of the metal of the blank as at *a*, Fig. 2, forming a burr similar to that made by the chisel in hand-cut files. (The cuts commence at the end 1 of the blank.) If a succession of such cuts were made the teeth would be of the form shown at a^1, Fig. 2, with the edge or top of the tooth rough and irregular. Instead of making this form of tooth, I feed the blank in such
213 a manner that the cutter as it moves across the blank will shear off the top of the tooth raised by the preceding cut and leave the tooth of the form shown at a^2, Fig. 2, with the back of the tooth at an angle with the front side of it and the edges of all the teeth smooth and uniform in height.

A file having its teeth formed as above described will leave the surface operated on by it in filing much more even and true than one would in which the height of the teeth varied on different parts of the file, whilst the more perfect and regular the form of the tooth is the better it will operate and the more durable it will be.

The same plan may be pursued in cutting "cross-cut" files.

Claim.

What I claim as my invention and desire to secure by letters patent as a new article of manufacture is a file having its teeth sheared off smooth and of an uniform height, substantially as specified.

MILTON D. WHIPPLE.

Witnesses:
THOS. R. ROACH.
P. E. TESCHEMACHER.

Ex'd: J. A. W.; M. McK.

(Here follows diagram marked p. 214.)

215 1791. Rec'd Feb'y 3, '59. XX.
No. 23645. Foreman.

Chas. Miller & Thompson W. Decker, ass'rs to Thompson W. Decker, aforesaid,

Of New York,
County of "
State of "
Oath renewed.

Machine for cutting files.
Rec'd Jan'y 18, 1859.
Petition, " " "
Affidavit, " " "
Specification, " " "
2. Drawing, " " "
Model, " " "
1. Cert. dep., $30, Jan'y 18, '59.
Cash, —.
Examined M'ch 26, '59. E. Foreman.
2. Issue—Shugert—March 28, 1859.
3. Patented Ap'l 12, 1859.
Recorded, vol. 98, page 599.
N. F.
Tools—metals.
Munn & Co., N. Y.
Rej. Feb. 7, '59.
Sp'c'n & 1 dr. r't'd Feb. 24, '59.
Ex'd: J. A. W.; M. McK.
Imp'd mach. for cutting files.

Rec'd in draughtsman's room Feb'y 1, '59. B. W.

[Endorsed:] 658 D. '82.

216 $30 cert. & 2 dr'gs.

Assigned in full to Thompson W. Decker.

Petition.

To the Commissioner of Patents:

The petition of Charles Miller and Thompson W. Decker, both of the city, county, and State of New York, respectfully represents—

That your petitioners have invented new and useful improvements in machinery for cutting files, which they verily believe has not been known or used prior to the invention thereof by your petitioners. They therefore pray that letters patent of the United States may be granted to them therefor, vesting in them and their legal representatives the exclusive right to the same upon the terms and conditions expressed in the act of Congress in that case made and provided, they having paid thirty dollars into the Treasury and otherwise complied with the requirements of said act; and they hereby authorize O. D. Munn, S. H. Wales, and A. E. Beach, of the firm of Munn & Co., or their accredited agents, to act as their attorneys in presenting the application and in making all such alterations and amendments as may be required.

CHARLES MILLER.
THOMPSON W. DECKER.

217 *Oath.*

CITY & COUNTY OF NEW YORK, } ss:
State of New York, }

On this 28th day of December, 1858, before the subscriber, a com-

missioner of deeds in and for said county, personally appeared the within-named Charles Miller and Thompson W. Decker and made solemn oath that they verily believe themselves to be the original and first inventors of the within-described improvements in machinery for cutting files, and that they do not know or believe that the same was ever before known or used, and that they are citizens of the United States.

D. G. CROSBY,
Commissioner of Deeds in & for the City & County of New York.

218 *Oath.*

COUNTY OF, CITY, & STATE OF NEW YORK, *ss:*

On this 10th day of March, 1859, before the subscriber, a com'r of deeds in and for said county, personally appeared the within-named Chas. Miller and T. W. Decker and made solemn oath that they verily believe themselves to be the original and first inventors of the within-described machinery for cutting files, rej't'd Feb'y 7, '59, and that they do not know or believe that the same was ever before known or used, and that they are citizens of the United States.

D. G. CROSBY,
Com'r of Deeds.

219 *Petition.*

Renewed oath filed M'ch 24, '59.

To the Commissioner of Patents:

The petition of Chas. Miller and T. W. Decker, of the city, county, and State of New York, respectfully represents—

That your petitioners have invented a new and useful improvement in machinery for cutting files, which they verily believe has not been known or used prior to the invention thereof by your petitioners. They therefore pray that letters patent of the United States may be granted to them therefor, vesting in them and their legal representatives the exclusive right to do the same upon the terms and conditions expressed in the act of Congress in that case made and provided, they having paid thirty dollars into the Treasury and otherwise complied with the requirements of said act; and they hereby authorize O. D. Munn, S. H. Wales, and A. E. Beach, of the firm of Munn & Co., or their accredited agents, to act as their attorneys in presenting the application and in making all such alterations and amendments as may be required and to receive
220 the letters patent when granted.

CHARLES MILLER.
THOMPSON W. DECKER.

221 To all whom it may concern:

Be it known that we, Charles Miller and Thompson W. Decker, both of the city, county, and State of New York, have in-

vented certain new and useful improvements in machinery for cutting files; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Fig. 1 is a central, longitudinal, vertical section of a file-cutting machine with our improvements.

Fig. 2 is a transverse vertical section of the same.

Similar letters of reference indicate like parts in both figures.

222 Erase A, per M'ch 24, '59. This invention consists in certain means for providing for the adjustment of the face of the file blank to the edge of the chisel during the cutting operation, so as to secure a uniform depth of cut all across the file. It further consists in a certain method of providing for the resting of the chisel stock on the file blank during the whole of the cutting operation for the purpose of regulating the depth of cut, the same means also providing for the raising of said chisel stock to afford convenience for taking out and putting in the files or file blanks and for the removal and replacement of the chisel; and it further consists in certain provision for changing the angle of the chisel relatively to the face of the blank.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation.

A is a bed plate which supports all the working parts of the machine. B is a carriage fitted to slide on the said bed plate and having fitted to it a rolling or rocking bed, C, such as is common to many file-cutting machines, for carrying the file blank *a* during the cutting operation. *b c* are clamps and *d* a screw for operating the clamp *c* to secure the file blank to the bed C. D is a feed screw for giving the necessary movement to the carriage B, to feed the file blank under the chisel to make the cuts at proper distances, the said screw having journals at its ends working in bearing in the ends of the bed plate and the thread working in a gear, *e*, whose journals are fitted to turn in bearings in the carriage. The said gear *e* is locked that it may operate as a nut in connection with the screw to feed the carriage forward, and is unlocked to be operated as a pinion, in combination with the screw, as a fixed rack to run the carriage back quickly.

223

E is the frame which contains the chisel stock F and all its appendages and the driving shaft G, said frame being hinged at *f* to the back end of the bed plate A, so as to provide for the raising of the chisel stock and chisel and all their appendages by means of a cam, L, arranged below the chisel stock, the said cam being fast upon a short shaft, I, which is arranged in a bearing in the standard *g*, and which is furnished with a hand wheel or handle, J, at the side of the machine. The chisel stock is held down when in operation by means of two strong springs, *h h*, connecting the front portion of the frame E, close behind the chisel stock, with

224

the bed plate A. The chisel stock F, which has the chisel-holder K fitted to slide freely up and down within it, is secured rigidly to the front of the frame E partly by two screw bolts, *i i*, which pass through two cheek pieces, *k k*, cast in the frame E and screw into the sides of said stock, and partly by two plates, *l l*, which are bolted to the sides of said stock by screw bolts, *j*, and to the frame E by screw bolts, *m*. The chisel-holder K, having the chisel *n* attached by means of a screw clamp, *o*, has a long stem, K^1, which passes through a guide in the top of the frame E, the lower part of which stem has a screw-thread cut upon it and passes through an opening in a plate or flange, *p*, bolted to or cast on the top of stock, F, and above the plate or flange *p*, the screw-thread on said stem is fitted with a nut, *q*, to which the plate or flange *p* constitutes a stop for the purpose of preventing the chisel descending beyond a certain depth below the bottom of the stock F and making a cut beyond a
225 certain depth when driven down by a spring, *r*, which is coiled round the stem K^1 between the nut *q* and the top of the frame E. The holder K has projecting from its back side an arm, *s*, which is operated upon to lift the chisel-holder and then to leave it suddenly to the action of the spring *r*, by means of a cam, H, on the driving shaft G, the spring producing the sudden descent of the chisel which effects the cut. The driving shaft G is driven by a belt running on its pulley, G^1, and it carries a cam, P, which operates the feed screw D by means of a ratchet motion.

The chisel stock F is intended to rest upon the file blank during the cutting operation, and thus by aid of the stop nut *q* on the stem of the chisel-holder to produce a uniform depth of cut all along the face of the file blank, whatever its profile. This method of regulating the depth of cut is the same as that described in the letters patent of Charles Miller, dated Nov. 11th, 1856; but instead of letting the chisel stock itself rest directly on the face of the file blank, as described in the before-mentioned letters patent, we attach to
226 the said stock for the purpose of supporting it on the said face what we term the gauge rest M, the effect of which in regulating the depth of cut in the successive operations of the chisel is the same as though the chisel stock rested directly upon the file blank, with the advantage that the said *guage* rest constitutes, in combination with the rolling bed C, a means of so adjusting the file blank to the edge of the chisel as to produce a uniform depth of cut all across or at both edges of either face of the file. The *guage* rest M consists of a bent lever secured to the chisel stock by a fulcrum pin, *t*, and having its bottom formed with a straight-edged foot-like piece, which rests upon the face of the file blank. In the upper end of the said *guage* rest M there is cut a female screw-thread to receive a screw, N, which is so fitted to a bearing, *u*, attached to the stock F, as to be permitted a longitudinal movement, but to be capable of being turned freely by hand to set the straight bottom edge of the foot of the gauge rest parallel with the edge of the chisel. The gauge rest, being thus set and bearing upon the file blank with the full force due to the tension of the

Insert B, per M'ch 24, '59.

springs *h h*, causes the rolling bed so to adapt its position as always to keep the face of the file blank parallel with the face
227 of the chisel, and thus insure the same depth of cut all across the said face. The adjustment of the blank by means of the guage rest can be effected by turning the screw N while the machine is in operation if it should be found that the chisel is cutting deeper towards either edge of the face. A

Insert C, p'r M'ch 24, '59.

The hing-ing of the frame E to the bed plate at *f* permits the gauge rest M to follow the curve of the face of the file, and thus cause the chisel—which is always arrested by the stop *p*—to produce a uniform depth of cut from end to end of the file, besides affording the greatest convenience for raising the chisel stock to permit the carriage to be run back and [forth]* to permit the removal of the chisel.

The angle of the chisel is changed relatively to the face of the file blank by slacking the screw bolts *i* and *m* on each side of the machine. The latter bolts pass through slots in the plates *l*, as shown in Fig. 1, and these slots, when said bolts are slackened, permit the chisel stock F to swing a limited distance on the two screws
228 *i i*. When the chisel is adjusted by swinging the stock back or forth the bolts are tightened up again, and the machine is again in working order.

229 8th. FEB. 7, '59.

Messrs. Miller & Decker, ass'ors, care Munn & Co., New York:

The examination of your file-cutting machine shows that the invention has been anticipated. For the first and second claims see patent to J. N. Jacobs, Apr. 6, '58, and to C. Miller, Nov. 11, '56. The alleged combination between the gage and rocking bed of the 1st claim is not recognized by the office. The use of slotted plates and screws of the 3d claim is no novelty, being the common property of machinists. See in connection with the above patents that of James H. Thompson, 27 Jan'y, '52.

230 NEW YORK, *Feb'y* 21, 1859.

To the Commissioner of Patents.

SIR: Please send us the specification and one drawing of Miller & Decker improvement in file-cutters.

Respectfully, MUNN & CO., *Attorneys.*

231 We are aware that in the patented file-cutting machine of J. N. Jacobs there is employed, in combination with a rolling bed, a foot piece carrying a shoe resting on the file blank in front of the chisel, which may be supposed to have some resemblance to our gauge rest, but it is for an entirely different purpose, and it operates in combination with an apparatus for regulating the depth of the

Erase & insert D, p'r M'ch 24, '59.

* Erased in copy.

successive cuts, the bed being left entirely free to permit the blank to accommodate itself to the edge of the chisel as the latter strikes instead of being held firmly with the face of the blank parallel with the edge of the chisel before the chisel strikes, as it is by our gauge rest. We do not, however, claim the rolling bed, nor such an oscillating foot piece as is used in the machine of said Jacobs.

But what we claim as our invention, and desire to secure by letters patent, is—

1st. The adjustable guage rest M applied, in combination with a rolling or rocking bed and operating substantially as
232 described, to support the chisel stock upon the file blank and hold the face of the blank parallel with the edge of the chisel, as herein set forth.

2nd. The arrangement of the cutter stock, cutter and all its appendages, and the driving shaft in a hinged frame, E, which is kept in an operative position by springs *h h*, substantially as and for the several purposes herein set forth.

3rd. The attachment of the chisel stock to its supporting frame by means of the screw bolts *i* or their equivalents, the slotted plates *l*, and screw bolts *m m*, substantially as and for the purpose herein specified.

CHARLES MILLER.
THOMPSON W. DECKER.

Witnesses:
D. G. CROSBY.
H. E. FARNSWORTH.

233 The specification of Miller & Decker's file machine is amended as follows:

A. Erase. 1. Erase the recital of the nature of the invention on pages 1 and 2.

2. Add after the words "pin (*l*)," on 15th line from
B. Insert. top of page 6, the words "upon which it oscillates."

3. Add after "face," on the 9th line of page 7—

C. Insert. In all other machines with which we are acquainted, whenever the chisel fails to cut evenly it is necessary to remove the chisel and grind down its edge so that it will cut straight. This frequently has to be done very often, especially if the attendant happens to be so unlucky as to put on an untrue edge in the first setting or sharpening of the chisel, for there is no way of adjusting the bed and blank to the cutter while the machine is in operation, but the machine must be stopped and the cutter taken out and adjusted by grinding to suit the bed and the blank. By arranging the the gage rest M to oscillate as we have deseribed the bed and blank are adjusted at any movement desired without stopping the machine. If the attendant observes that the chisel is cutting
234 unevenly he has only to oscillate the rest M by turning the screw N, which will cause the foot of the rest to bear upon

the desired side of the blank and bring it into line with the cutter.

By arranging the rest to oscillate we are also enabled to produce better work, because we can adjust the cutter to operate with more nicety upon all the work than it is possible to do under the method of adjusting pertaining to other machines as mentioned.

4. Erase pages 9 and 10 and substitute—

D. Erase & insert. Having thus described our invention, we claim and desire to secure by letters patent—

1st. Arranging the gage rest M to oscillate upon a fulcrum (*t*) located in relation to the cutting chisel substantially as shown, so that by moving the arm of said rest laterally by means of the screw N the bed C and blank (*a*) may be adjusted to correspond with the cutting edge of the chisel, as herein set forth.

2nd. Hing-ing the frame E, which carries the chisel and it appurtenances, to the frame A by a joint at (*f*), so that the
235 rest M may readily follow the curve of the file blank, and with the chisel be thrown back when desired, all as herein shown and described.

MILLER & DECKER,
By MUNN & CO., *Attornies.*

New York, March 22, 1859.

[Endorsed:] Amendments A, B, C, & D. Filed March 24, '59. Miller & Decker file machine. Amendment, M'ch 22, 1859.

236 NEW YORK, *M'ch* 22, 1859.

Com. of Patents.

SIR: Herewith we return spec'n & dr'g of Miller & Decker's file machine with a new oath and amend't.

The case is submitted for reconsideration.

If the claim now presented or any part of the spec'n is deemed defective we shal feel obliged for the suggestion of such a change as will more fully meet the views of the office.

Resp'y, MUNN & CO., *Att'ys*

[Endorsed:] From agents. Filed March 24, '59.

237 Circuit Court of the United States, District of Rhode Island, *ss:*

NEW AMERICAN FILE COMPANY
v.
NICHOLSON FILE COMPANY.

In the above-entitled cause it is stipulated and agreed that Defendant's Exhibit "New York Directory, June 26th, 1883, J. A. S., ex'r," shall not be reprinted as part of the record to be used in the trial of said cause in the Supreme Court of the United States on appeal, but that in place of the whole — said directory the following

shall be included in the record as showing the substantial parts of said exhibit for the purposes of this cause:

Title Page.

"Wilson's
Business Directory
of
New York City.
Published annually.

New York:
John F. Trow, Printer and Publisher,
379 Broadway.
1859."

238 On page 408 the following appears under the heading, "File and saw makers. Marked thus † make files only:

* * * * * * *

†Decker, Thompson W., f't E. 25th."

WM. W. DOUGLAS,
Solicitor for Compl'ts.
BENJ. F. THURSTON,
Sol'r for Def't.

239 *Final Decree.*

NEW AMERICAN FILE COMPANY
v.
NICHOLSON FILE COMPANY. } In Equity. No. 1007.

This cause came on to be heard at the November term of this court, 1886, upon the bill, answer, and proofs, and was argued by counsel and was held for advisement to the present term; whereupon, upon consideration thereof, it is ordered, adjudged, and decreed that the complainant's said bill of complaint be dismissed, and that the complainant pay to the said defendant its costs, amounting to the sum of —.

Entered as the decree of this court, per order thereof, this 16th day of July, A. D. 1887.

HENRY PITMAN, *Clerk.*

From which decree the complainants claim an appeal in open court to the Supreme Court of the United States, and the same is allowed.

240 The following is the opinion of the court upon which a decree was entered July 16th, 1887.

Opinion of the Court, June 2d, 1887.

COLT, *J.:*

In this suit the defendant is charged with infring-ment of the third claim of letters patent No. 29236, dated July 24th, 1860,

granted to Etienne Bernot for an improved machine for cutting files. The patent was confirmed by act of Congress July 16th, 1862, and was extended for seven years from July 24th, 1874. The plaintiff derived title to the patent by assignment December 1st, 1876.

In cutting files it is important that the edge of the chisel be parallel with the surface of the blank along the line where the cut is to be made, so that the cut shall have an equal depth across the face of the blank.

To understand the Bernot invention it is necessary to refer to the patent No. 8199 issued to John Crum July 1st, 1851. The feature of the Crum invention was introduced into a file machine of what is called a rolling bed, which is a supplementary semi-cylindrical bed capable of rocking, placed in the main bed of the machine. This rocking bed permits the file blanks which are tapering from heel to point always to present a surface parallel to the cut-
241 ting edge of the chisel The Crum machine was also provided with a presser foot for holding the blank down in the rolling bed. In the Crum machine the edge of the chisel brought the file blank on the rocking bed into parallelism with the chisel and also cut the teeth. Bernot conceived the idea that by making the presser foot or guide adjustable, so that it could be set parallel with the chisel, he could secure the necessary parallelism between the cutting tool and the file blank, and thus relieve the chisel from the double duty it imperfectly performed in the Crum machine. Bernot employs an adjustable presser foot set parallel with the chisel, and it bears on the file blank in a line slightly in advance of the edge of the chisel. As the blank moves along under the presser foot, the rocking bed yields as may be *be* required by variations in the thickness of the blank.

The third claim of the patent, which is the only one in controversy, is as follows: "In the arrangement of a guide set parallel to the graver, as hereinbefore described and referred to in figures 1 and 2, drawing II."

In the Nicholson machine the parallelism between the cutter and the blank is brought about by proper guiding before the cutting tool is set in its holder. Should the cutting tool prove slightly im-
perfect or become so in use so that its edge is not parallel to
242 the line across the blank, then an adjustment is made by turning the tool slightly in a vertical plane, but the result of any such adjustment is to throw the edge of the tool and the presser out of parallelism.

In Bernot's machine the parallelism between the cutter and the blank is brought about by adjusting the presser foot. In the Nicholson machine the presser foot is fixed and the adjustability belonging to the cutter is an adjustability which operates not to bring the cutter and blank into parallelism, but to throw them out of parallelism. The main feature of the Bernot machine of adjusting the presser foot in a horizontal plane so as to make it parallel with the cutter is wanting in the defendant's device.

The contention of the plaintiff that the third claim of the Bernot patent covers every machine in which the presser foot or guide is

set parallel with the chisel, it seems to me, cannot be sustained. Claim three is for "the arrangement of a guide set parallel to the graver, as hereinbefore described," &c. The claim must be construed with reference to the specification and drawings. It is the means or mechanism by which a certain result is accomplished that is covered by the patent, and the question is whether the defendant accomplishes the same result by substantially the same or equivalent means. In view of the radical difference between the two machines already pointed out I am satisfied that the defendant does not infringe, and this disposes of the case without rendering it necessary to consider the other defense which is raised.

Bill dismissed with costs.

243 *Bond on Appeal.*

Know all men by these presents that we, The New American File Company, a corporation created by the General Assembly of the State of Rhode Island and located and doing business at Lincoln, in said State, as principal, and Stephen A. Jenckes, of Lincoln, and William F. Sayles, of Pawtucket, in said State of Rhode Island, as sureties, are held and firmly bound unto the Nicholson File Company, a corporation created by said General Assembly and located and doing business at Providence, in said State, in the sum of five hundred dollars, to be paid to the said Nicholson File Company or its successors; to which payment, well and truly to be made, we bind ourselves and each of us, jointly and severally, and our and each of our successors, heirs, executors, and administrators, firmly by these presents.

Sealed with our seals and dated this twenty-sixth day of July, in the year of our Lord one thousand eight hundred and eighty-seven.

Whereas, at a circuit court of the United States holden at Providence, within and for the district of Rhode Island, by adjournment on the 16th day of July, A. D. 1887, in a suit in equity depending in said court, wherein the said New American File Company was complainant and the said Nicholson File Company was respondent,

244 which suit was docketed in said circuit court No. 1007, a final decree was rendered against said New American File Company dismissing its bill of complaint, and the said New American File Company has appealed in open court from said decree to the Supreme Court of the United States, to be holden at Washington on the second Monday of October next after the date hereof:

Now, therefore, the condition of this obligation is such that if said New American File Company shall prosecute its said appeal with effect and answer all costs if it fails to make its plea good, then this obligation shall be void; otherwise shall remain in full force and virtue.

NEW AMERICAN FILE CO.,
STEPHEN A. JENKS, *Treasurer.* [SEAL.]
STEPHEN A. JENKS.
W. F. SAYLES.